INTO THE FREEZER ~AND OUT

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Sh. No. 50

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~and Out

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By

DONALD K. TRESSLER, Ph.D.

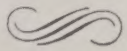
Food Consultant, Westport, Conn.; Formerly Head, Division of Chemistry, N. Y. State Agricultural Experiment Station, and Professor of Chemistry, Cornell University

CLIFFORD F. EVERS, B.S.

Technical Director, National Association of Frozen Food Packers, Washington, D. C. Formerly Research Director, Birds Eye–Snider Division, General Foods Corporation, New York, N. Y.

LUCY LONG

Author of Numerous Bulletins Published by General Electric Consumers Institute



NEW YORK

THE AVI PUBLISHING COMPANY, INC.

1946

THE AVI PUBLISHING CO., INC.
NEW YORK 3, N. Y.

Second Printing

Printed in the United States of America
BY MACK PRINTING COMPANY, EASTON, PA.

Foreword

KATHARINE FISHER, Director of Good Housekeeping Institute, makes a very significant statement in discussing the role of home-frozen foods in future homemaking. She points out that "the how-to-do principles of home freezing as well as the engineering mechanics of home freezers are the beneficiaries of the many years of research and experiment that are behind the success of commercial food freezing and mechanical household refrigeration."

Into the Freezer—And Out is also the beneficiary of this vast amount of research and experiment carried out by scientists and food technologists over the past *twenty* years. Research has clearly demonstrated that the homemaker, or the locker operator who performs food freezing services for her, can produce at home or in the locker plant, all of the commercially prepared frozen foods—and many, many more—with the same perfection of flavor, color, texture, nutritive value, and palatability. The combination adds up to better eating and more eating pleasures in the home than has ever before been possible.

Home freezing of foods will not have to undergo the trial and error period of success or failure in the homemaker's kitchen at the expense of her time, effort, and cost of materials which she has encountered with many other things pertaining to homemaking. She is assured of success at the outset. But, as with all things new, that success is measured by how much reliable food freezing information reaches her, how well she is able to

apply the preparation procedures about which she learns, and how well she is able to fit her home freezer or rented locker into her individual household economy and plan of living.

To this end the authors conceived and prepared this book. Much of the material presented here is a digest of facts taken from the technical publication by Tressler and Evers, "*The Freezing Preservation of Foods*," to which the authors refer those persons interested in obtaining more comprehensive information and information concerning the commercial aspects of freezing foods. *Into the Freezer—And Out* is published for all persons interested in home freezing, in planning for and using a home freezer, a rented locker, or any local locker plant facility.

It is dedicated to the hope that as the reader comes to the last page, he will feel he knows everything he needs to know about freezing foods successfully; that he will have at his fingertips, for ready reference, the answer to any food freezing problem he may encounter; that it will contribute materially to the delights of owning a home freezer or renting a locker, and eating the wonderful foods each so providentially preserves.

Donald K. Tressler
Clifford F. Evers
Lucy Long

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Chapter I

THE FOOD OF THE FUTURE HAS A "PAST"

The freezing of foods has a past that is interesting, erratic, surprising, and altogether promising for the future. Like other true-life stories, freezing also has its skeleton in the closet; its past rears an ugly head at the mention of two words which are apt to find hearty disfavor in the public consciousness: cold storage.

Perhaps we should belong to the school that believes in keeping skeletons hidden. But, we reason, frozen foods and the science of home food freezing are going to be as much a part of American family life in years to come as bacon and eggs for breakfast—why not explain now that cold storage *then* and cold storage *now* are just as vastly different as the low-slung waistlines of the fashionable, feminine '20's and the well-proportioned, properly placed ones girding the modern maid to-day. We are ready to place a bet, too, that *no one* who has not made a life's study of food tastes can detect the taste-difference between to-day's properly handled cold storage egg and to-day's fresh egg. Such have been the advances of cold storage in the past two decades.

Cold storage provided the parental roof under which Frozen Foods grew first into a robust healthy child, then into a giant of adolescent age held in leash by economics of a war-torn world. Such bonds served only to accentuate its desirability. It is still a child, but a promising one for it is the beneficiary of many years of scientific research

and experiment. When maturity is reached, this infant industry will bear blessings for all the world, for people in all climates, in all walks of life, in all economic and age groups.

Would it be surprising to learn that freezing of foods has been a common practice for centuries in some parts of the world? In Arctic regions this "natural" means of food preservation has been employed as a matter of necessity. In more temperate climates but where winters are long and extremely cold and a fresh food supply is limited to a fraction of the year, the cold of nature and the protection of ice are used to advantage as food preservatives.

The freezing of fish was a profitable business for almost a decade before this method was adapted to other foods. It was natural then that those foods which did not adapt well to drying, salting, brining, or canning were considered for freezing. Freezing expanded to include poultry, eggs, and meat.

That there were off-flavors in the early days of cold storage is not to be denied. Little was then known about the effect of freezing temperatures on foods, or the value of quick freezing. Consequently, foods placed in cold storage during those years were not always stored at sufficiently low temperatures to prevent off-flavors and slight rancidity; besides, they were often packed in large barrels or cases for freezing which slowed up the actual freezing process thus helping to produce an inferior product. Further, they were always thawed before sale to the housewife and often were permitted to stand around after thawing.

Even though off-flavors were looked upon with disfavor and were the cause of suspicion on the part of the consuming public, the cold storage industry grew to undreamed-of proportions partly because it was a vital necessity to the

preservation of seasonal surplus as food supply for the metropolitan centers where population figures showed a steady increase.

The cold storage warehousing of food continued to grow; but the science of freezing of foods remained somewhat static because of the inability of the packers to obtain a product of uniformly high quality.

In 1924, Clarence Birdseye, a biologist and fur trader, began to carry out practical experiments on the quick freezing of pan-dressed fish. Birdseye had spent six years fur trading in Labrador and knew how well fish and meat could be preserved by freezing and storage out of doors during the long cold Arctic winters. Birdseye knew that if freshly caught fish were quick frozen and then stored at a low temperature until used, the cooked product could not be distinguished from strictly fresh fish. He also knew that meat could be perfectly preserved by quick freezing and storage at zero temperatures.

Birdseye recognized that the frozen fish being marketed in 1924 were of poor quality because little care was taken in the selection, preparation, packaging, freezing, storage, and marketing of the product. Birdseye recognized the advantages of packaging foods prior to freezing and invented machines for quick freezing small packages of food.

Birdseye became the man with the *big idea*. In 1929 he set out to demonstrate that very great care should be taken in selecting, handling, preparing, packaging, freezing, and storing of frozen fish, shellfish, meat, poultry, fruits, and vegetables. Then a quality comparable to an excellent grade of fresh foods could be produced. Further, he was convinced that the public would buy the small family-sized packages in the solidly frozen condition if the quality of the product was high.

At first housewives were skeptical of the quality of the

new type of frozen foods, but those who tried them returned to buy more and gradually the industry was established on a sound basis. Those homemakers of Massachusetts who purchased Birdseye Frosted Foods as an experiment usually returned as satisfied customers for more.

Birdseye Frosted Foods did not enter the food world unnoticed, for in 1929 (the same year Birdseye established a Research Laboratory to solve his freezing problems) there appeared two scientific reports on this new idea of freezing foods. Dr. E. F. Kohman, in his annual report of the research laboratories, National Canners Association, summarized his investigations on freezing fruits and vegetables in small containers suitable for retail distribution by noting that freezing and thawing caused abnormal enzymic activity and consequent development of off-flavors. He observed this effect was so pronounced with raw vegetables as to make their freezing impractical; but if enzymes were inactivated by a short precooking treatment, vegetables could be frozen, and if properly stored, their flavor would remain unimpaired over a normal distribution period.

Drs. W. V. Cruess and M. A. Joslyn in their work at the Fruit Products Laboratory (now known as the Division of Food Technology), University of California, also came to the conclusion that it was necessary to blanch vegetables before freezing.

Visitors at the Foods Building at Chicago's Century of Progress (1933–34) will recall the blonde young miss in starched white plying exposition goers with samples of the new frozen foods. It was perhaps one of the most insignificant exhibits for size, grandeur, and pompousness; one of the most significant for promise of the future.

The acceptance of commercially frozen foods showed a steady gain in popularity, the depression of the Thirties'

Perhaps the earliest photographs ever published showing freezing of fish in pans (above) and stacking the frozen product for storage (below).

Reproduced from The Preservation of Fishery Products for Food written in 1898 by Charles H. Stevenson and published in 1899 by U. S. Commission of Fish and Fisheries.

Panoramic view of commercial processing plant of California Consumers Corporation. Produce enters at back where it is placed on production line to be cleaned, washed, trimmed, blanched, inspected. Finished packages ready for freezing come off line at left center. Close-up of inspection belt for lima beans shown in photo at left.

The multiplate freezer developed by Clarence Birdseye and used by Birds Eye-Snider, Inc., employs the same principle of freezing (by rapid conduction from both sides of the package) as that of the original Birdseye belt freezer. Photo shows trays of packages being placed in such a freezer.

notwithstanding. These new frozen foods compared surprisingly well with the fresh foods: beautiful, brilliant colors; fresh from the garden flavors. The reputation of a hostess' culinary achievements was assured upon the triumphal entry on the menu of out-of-season delicacies made possible by frozen foods. These special-occasion foods, by virtue of their goodness and eye-appeal, soon found their way to the every-day table of many American homes where the homemaker learned another of their merits: unlike fresh foods, these new frozen foods required no meal preparation other than cooking.

Out-of-season delicacies of another kind gave rise to the possibilities presented by the home freezing of foods.

Early in the history of cold storage warehousing, storage space was rented to merchants for storing quantity purchases of perishable foods. Eventually, this service grew in scope to provide farmers with a storage box where their surplus meat could be frozen and stored. Later these boxes were built in tiers and constructed as drawers and cupboards in commercially refrigerated warehouses. Sportsmen discovered them as the perfect answer to their problem (albeit a pleasant one) of what to do with abundant catches of game meat, birds, and fish.

Farmers were quick to capitalize on this new convenience which enabled them to have fresh meat the year round instead of only during the cold months when they could butcher one of their own meat animals. To the enterprising ingenuity of locker plant operators goes the credit for expanding this freezing meat service into a freezing meat-vegetable-and-fruit service.

The freezing of foods commercially on a quality control basis with commercial equipment was a far cry from the first crude attempts at home freezing of foods other than meats. This was due to lack of knowledge on the part of

the individual undertaking such procedures. State experiment stations, equipment manufacturers, public utilities, and educators not only have been, but are to-day, of great help to those interested in this new phase of frozen foods.

By 1938 interest in frozen foods was so paramount, manufacturers of electrical household equipment were developing home freezing cabinets. Only a few of these reached the market because of the impact of war sweeping the nation and the world.

All factors considered, the development of commercial food freezing has been phenomenal; and as a means of home food preservation its expansion will be even more so. Why? Because freezing will preserve the flavor and color of foods better than any other method. Because frozen foods are convenient. Because their use is economical. And because they are more nutritious than foods preserved by other means.

It is hard to say where convenience ends and economy begins. Like shingles on a roof, their edges overlap to form one whole as a household phrase that carries special significance. There is the time saved by fewer shopping trips made possible by a home supply of frozen foods which is a convenience; the time saved by the purchase of ready-to-cook vegetables, seafood, fish, and poultry is of increasing importance as a convenience in modern living where interests and activities go beyond the four walls of home.

The nation's homemakers have always been aware and particularly proud of home-grown, home-preserved foods as representing perhaps the greatest food economy in the American budget. Now that freezing facilities are available, the home preservation of foods will be re-evaluated; many who had given up home canning because commercially canned products were of such high quality and could

be purchased so cheaply, will turn to home freezing with new interest and delight at the results which can be obtained.

The farmer is interested in freezing his own food because for him it will preserve his entire year's supply of foods except staples and occasional extras. The inhabitants of small towns are interested in freezing because vegetables, fruits, and meats which abound in adjacent rural areas can be purchased at low price and preserved to supply the perishable food needs for the year. The suburbanite and country estate dweller are interested in the luxury as well as the convenience and economy of frozen foods stored in home freezing facilities. Those living in metropolitan areas are likely to be the least interested in or affected by the home freezing of foods in the immediate future. Although many already buy commercially frozen foods in preference to canned or fresh, the vast majority have long been accustomed to shop daily for foodstuffs at city markets where there is always a plentiful supply of fresh produce at competitive prices.

Freezing means many things to many people. To the majority, it makes possible a supply of foods heretofore not available at some seasons of the year. To others, it means greater accessibility of hard-to-get food supplies. To all, it provides better food in so far as flavor, appearance, and nutritive value are concerned. But to what extent freezing will affect our living habits and our food pattern can only be surmised. At this point in the rapid development of both commercial and home food freezing, a prediction as to the future expansion or limitations of freezing of foods would be like printing next week's newspaper to-day. Anything can happen—a lot will.

Chapter II

FREEZERS ARE REVOLUTIONARY AND DEMOCRATIC

About seven or eight years ago, when one of the few home freezers then in existence was delivered to a suburban home, the wife upon seeing a freezer for the first time promptly nicknamed it the "big white elephant." She meant all the name conveyed, too. To-day—after her home freezer has been under fire on the home front during food-scarce years when she fared better than her neighbor, and she learned to appreciate her big white elephant for many other reasons as well—no term is too endearing for her Arctic Treasure Chest, her Magic Miracle of Eskimo Fare, her Aladdin's Lamp that makes winter summer and summer winter, etc.

That's how revolutionary home freezers are. And the strange thing about them is that our universal enthusiasm for them to-day is shared equally by men *and* women. Yet, neither man nor woman can visualize just where the home freezer will transport this wonderful new food world. For the revolution that the home freezer has started is just beginning. Of one thing we can be certain: it will affect the entire world before it has run its course.

There is no segment of civilization anywhere in the world that cannot benefit from this new method of food preservation. Think of what freezers will mean to the tropics, and what a feat of engineering science virtually to bring north pole temperatures to the equator for the purposes of food preservation. The rich soil there grows

fruits and vegetables in abundance, but the climate is not well suited to raising meat animals; nor will fresh foods keep in such warm climates for any length of time unless they are properly refrigerated. In many places in South America where no refrigeration is available, meat animals are killed, sold, and eaten all in the same day.

Then there are the outposts of civilization in the far north and far south where the growing season for green foods is very short; where winters are long and much of the year the population is forced to eat most of their food in some preserved form. Even in our own temperate zone, we have to depend in great part upon preserved foods from six to eight months out of the year.

Wherever freezers make their appearance, they will revolutionize eating habits, buying habits, and meal preparation habits. The mere idea of freezing foods in a cabinet and having them make an appearance on the table months later looking not a day, hour, or minute older than when they were put in, has stimulated women to renewed interest in home food preservation and to new interest in foods. Freezing of foods has spurred men of the food industry to accomplishments never before dreamed possible.

Because of freezing, Mrs. John Doe, R.F.D. 2, Keokuk, Iowa, can bake her pies and cakes and roast her meat in January for the combine-harvester crew she will have to feed in July or August. That may not mean much to you if you live in the city, but the range in the farm kitchen goes full blast almost day and night at threshing time—sometimes even the neighbor's range helps out through the crisis. If a great part of her work can be done beforehand, a very trying and tiring time can be made much easier.

Speaking of trying and tiring times, let us follow the

footsteps of Mrs. Green and her neighbor, Mrs. Brown, who live at 17th and Pine Streets, Philadelphia, as they go food marketing. Sam, their neighborhood groceryman, cannot compete with the big food stores on fresh perishables, so the ladies stop there first to leave with him an order for their staple foodstuffs, bottled goods, soaps, and the like—it's all heavy to carry and Sam will have it delivered to their door for them. After leaving Sam with a small feeling of guilt down deep in their hearts for not buying everything at his store, they walk down to Broad Street, one of Philadelphia's main thoroughfares. On Broad Street, they inspect vegetable prices at two supermarkets, then decide to go on over to Market Street (a matter of another half dozen or so blocks) where the lowest food prices are usually to be found. Besides, the Farmers' Market there is always enticing with garden-fresh produce brought in that morning from Lancaster and surrounding counties. Mrs. Green and Mrs. Brown recognize bargains when they see them: a 3-cent saving per pound on green beans; 5 cents a dozen on sweet corn. Once found, the rest is easy. Mrs. Brown buys 4 pounds of green beans and 1 dozen ears of sweet corn saving 17 cents. Mrs. Green buys 1 bushel of green beans and 6 dozen ears of sweet corn, and because of the quantity of her purchases is able to make arrangements for delivery. Her savings amount to $1.26! *She* has a home freezer tucked away in her kitchen in which she can freeze small surplus quantities of food as well as store commercially prepared frozen foods which she buys in quantity at special prices. Mrs. Brown has no way of preserving her perishable fruits, vegetables, and meats beyond the length of time her household refrigerator keeps them in good eating condition. But Mrs. Brown is enviously watching the greater savings Mrs. Green is able to make and is figuring budget costs

and income expenditures so she can have one of the new household refrigerators with a freezing compartment which will do for her much the same that Mrs. Green's home freezer does.

Freezing is so easy, a woman can preserve small quantities of surplus foods while she is preparing dinner. And by really being able to take advantage of bargain prices, the woman in the city for the first time can begin to increase her food savings by dollars instead of pennies.

If you live in a suburban area or smaller rural community you may be doubly blessed with the freezer advantages Mrs. Doe enjoys on the farm and those coveted by Mrs. Green in the city, if you grow some of your own vegetables and take advantage of special prices to fill out your quota of frozen food supplies.

No matter where you live, your table will be enriched by better food and by many foods heretofore little known or unknown. With freezing, even the most perishable foods can be transported anywhere in the world. Some day you may be able to serve palm hearts or chuchu as the vegetable with a choice roast of beef; and you will get to taste—without ever leaving home—the true fruit flavors of tree-ripened tropical fruits most of which, outside of bananas, are known only to a few world-wide travelers or to those living in the semi-tropical sections of this country. There is the potent flavor of guavas, the delicate flavor of mangos, the strange flavor of avocados. Incidentally, you can freeze and serve avocados as a dessert just as they do in Brazil. It is simple to prepare and is delicious! Look on page 132 for detailed information on how to prepare it, then try it yourself. You are sure to like it for avocado served this way is one of the most delightful eating pleasures ever experienced. No wonder it is a Brazilian favorite.

That Brazil and other South American countries will send us some of their tropical taste treats via the frozen foods industry is almost an established fact, for already representatives have investigated these possibilities and frozen tropical fruit salad is likely to appear on our North American markets in the near future.

Those foods native only to certain localities in our own country will also become well known and relished in all other sections of the country. Marvelous tasting fish and shellfish inhabiting the deep waters of our long coastlines will be frozen and shipped everywhere to satisfy a long-dormant inland appetite. Whereas haddock, red snapper, pompano, bluefish, swordfish, sole, halibut, lobsters, shrimp, and oysters have been available only within a few hundred miles inland from the coast, now the pleasures of eating fresh fish from the sea can be enjoyed by all.

Are you beginning to grasp the vast activities and industry that the home freezer is instigating? Do you see, also, that home freezers are as democratic as any political or social policy ever evaluated by man?

Take almost any facet of democracy as we conceive it, and you will find home freezers exemplifying the same ideals in the food world. Freedom from want? Yes! Freedom from fear? From fear of famine, yes. Better living for all? Yes! Reciprocal trade? In national and international food markets, certainly! Exchange of neighborly friendliness between nations? By all means! We will eat their foods while they will eat ours—and how better to become acquainted than sitting down to the table with them even though by proxy.

In the democratic food world of home freezers there will be no food barriers: geographical, social, or economical. Mr. and Mrs. Ritz in New York may dine at a famous restaurant and enjoy their favorite food, quail on toast;

but Mr. and Mrs. Jones living 50 miles from Portland, Oregon, will be enjoying it too—out of their home freezer; a delicacy that costs them practically nothing since Mr. Jones likes to hunt.

Freezers will bring about much the same leveling process in income groups in so far as food is concerned. Take, as an example, the income strata typified by pigs knuckles and sirloin steak. Pigs knuckles fit into a tight food budget very easily; steak does not. A man of affluence can always be spotted by the way he flourishes steaks not only upon himself but upon his friends. With freezing facilities at a local locker plant, or a home freezer of his own, the man of modest means, by purchasing wholesale cuts of beefsteak at considerably reduced prices, will not only be able to enjoy steaks more often, but he may even be able to afford to treat his friends once in a while. He may not be able to afford as much food as the rich man, but he will be able to buy *as good!*

One of the best things about freezers is that they are for *everybody*, not just the privileged few. Their cost, even at the outset of the postwar manufacturing period, is only slightly more than the cost of ordinary household refrigeration comparing cubic foot storage space. Upkeep costs, too, are not excessive because years of refrigeration manufacturing experience are behind the refrigerating principles of the home freezer. The operating cost will not be great since a freezer uses little more electricity than a household refrigerator of comparable size.

Your freezer *will pay for itself*. And this is not just tall sales talk, nor theoretical paper work. It has actually been proved by those families who have owned a freezer for a year or more. They report savings that vary from around $50 to $100 and upwards per year. But the most

significant thing about their reports in the majority of cases is that while they are grateful for the dollar-and-cents savings made possible by their freezer, what really impresses them and makes freezer ownership downright thrilling is that it affords them *better eating*. At the same food costs—or less, you can eat *more* and *better* meats, fruits, vegetables, and delicacies!

It's the Store That Never Closes

The one person who appreciates the freezer above all others is mother. For her it does many things besides provide her family with more and better food: it is her very own grocery store stocked with foods of her own choosing; her grocery store packed with foods that are all ready for the table or range; her store that's never too busy to wait on her promptly; her store that knows no after-hours or Sundays.

In return for these grand services, of course, payment must be rendered in the form of the work it takes to get the freezer full and keep it under good management. Even though the procedure for freezing foods is easy, it does involve work, but mostly table preparation work that would have to be done anyway; and most mothers are such good managers they usually can get the family to pitch in and help on the food-freezing tasks when large quantities are to be frozen.

Or, if mother hasn't the time or the inclination to freeze foods on a wide scale, she can pay money to have the grocery store of frozen foods brought to her door by means of a refrigerated truck loaded with all kinds of good things to eat which she can simply transfer to her own home freezer for storage. Department stores and food retailers all over the country are establishing frozen food delivery routes in the cities and surrounding areas which they

serve, so that anyone with home freezing facilities may take advantage of such a service to buy commercially frozen vegetables, fruits, meats, poultry, fish, shellfish, cooked foods, and baked goods in quantities which are delivered to the home. A customer merely notifies the store in advance the kinds and quantities of food wanted; her order will be left as the refrigerated truck covers its regular route. In some cases the stores even furnish a small size freezer at a nominal monthly rental charge for the purpose of storing these foods.

If You Have Not Yet Purchased Your Freezer

In case you have not yet purchased your freezer, you may like to know something about the kinds and types of freezers offered, what good construction features to look for, what operating costs are likely to be, etc., so you can understand more of what the dealer in home freezers will talk to you about when you go to see him. In turn, you will be able to ask helpful questions about his particular manufacturer's product if you are acquainted with some general freezer information.

The freezer you buy will have its problems of demand and supply pertaining to your particular family needs. There are questions facing each family who are prospective owners: Will your freezer be stocked with home-grown and home-frozen foods in large part, or will you depend largely upon commercially prepared frozen foods? What kinds of food will you want your freezer to furnish? How many persons will it have to supply such foods for? How much food will this amount to? For how many months of the year will you depend upon foods from your freezer? And what size freezer will it have to be to accommodate this food traffic?

To predetermine the answer to each as nearly as possible before purchase is a matter of major importance so that the greatest satisfaction may be derived from your purchase, or investment. The best help which can be given the reader is to draw some theoretical case histories based on pounds of food which can be stored per cubic foot of freezer space and on the purposes for which various types of freezers have been designed.

Case No. 1: If you are a family living in a small town or city, and have no means of procuring home-grown produce for freezing, or do not have time to devote to home preparation for freezing except occasional small quantities, a small freezer may serve your purposes, or you may wish to invest in a refrigerator which has a separate freezing compartment. A 4-cu. ft. freezer will accommodate from 140 to 180 pounds of foods when full. It is used in the main for storage rather than freezing although it can be used for freezing small quantities. Refrigerators with separate frozen food compartments will hold an ample supply of foods for ten days to two weeks, depending upon whether or not the supply is to furnish all fruits, vegetables, and meats consumed. A 3- or 4-cu. ft. freezer will supply the complete preserved food requirements for a family of two for a much longer period. Furthermore, almost every size kitchen will accommodate a small 3-cu. ft. freezer for it takes up no more room than the ordinary floor space of a kitchen storage cabinet. The top is of right height also to be used as a supplementary work surface.

Case No. 2: If you are a family of 2 to 4 and do not have access to any home-grown foods and plan to use your freezer for the storage of commercially prepared foods bought by dozen or half-dozen lots, and wish for small additional space to freeze occasional extras such as baked

goods, cooked foods, leftovers, etc., a 4-cu. ft. freezer should be of sufficient size to accommodate your needs. This size will accommodate a full three months' meat supply, or an entire month's supply of fruits, vegetables, and meats.

Case No. 3: If you are a family of 4 and have a garden which can produce enough surplus to supply vegetable needs throughout the year which can be frozen for use during non-productive months, a 6-cu. ft. freezer accommodating from 210 to 270 pounds of food will give you sufficient freezer space for much of your home-grown garden produce, plus extra space which can be utilized for freezing and storing fruits and meats, if desired. In case meats can be purchased direct from producer, or commercial or wholesale cuts can be purchased, then it is better to have also enough freezer space to store a large quantity of meats, and a 9-cu. ft. freezer may be the better size to buy, giving additional space for about 100 pounds of food.

Case No. 4: If you are a family of 3 to 5 and will want the freezer to be the main source of supply for a considerable proportion of your perishable food needs, some of them home-grown and some purchased, from 9- to 12-cu. ft. storage space will be needed for such a food supply, accommodating up to from 300 to 500 pounds of food.

Case No. 5: If you are a family of 4 to 6 and live in a small town or suburban community and will need the freezer to supply all your preserved fruits and vegetables, and part of your meat supply, from 15 to 24 cu. ft. of freezer space should accommodate such foods; if you wish the freezer to supply the complete meat needs as well, at least 24 to 36 cu. ft. of freezer space is required.

Case No. 6: If you are a family of 6 to 8 and want to plan a complete freezer program for all fruits and vegetables when the fresh is not available and a continuous

meat supply is desired, don't skimp on purchasing a good size freezer. From 36 to 50 cu. ft. (or even larger) should be the smallest size freezer to consider buying.

Case No. 7: If you are a family of any size who lives on an acreage where all your fruits or vegetables are grown and meat animals are raised to furnish the full year's food quota, you may wish to plan for a "walk-in" cooler and freezer room which will take care of all your refrigerated food needs for freezing, for frozen storage, and for cool storage. This type of freezer would include as much as 160 to 760 cu. ft. of space, approximately one-third of which would be for freezing and storage. The cool storage space would accommodate the chilling of meat carcasses, root vegetable storage, cool storage for fruits which are sometimes cellar stored, cool storage for dairy products, etc.

Wide Variety of Freezer Types and Sizes

The larger walk-in freezers are usually custom or home built so they can fit the particular needs of the household or farm operation. Some of the prefabricated walk-in rooms are available in expandable sections of 100 cu. ft. which can be added to the original 160-cu. ft. unit.

Because of the varying needs for freezers on the farm, there are a few families who might prefer to build whatever size farm freezer is needed. Very useful information on construction of farm freezers will be found in the technical book on freezing by Donald K. Tressler and Clifford F. Evers, "*The Freezing Preservation of Foods*" which is also published by The Avi Publishing Co.

But for all intents and purposes, the home freezers manufactured to-day represent such a wide range of sizes and use features that only in rare instances will it be desirable to prefer a home-built unit, for besides the cost of

construction materials it takes good construction to build a freezer that will accurately maintain a controlled temperature, and that will operate efficiently at all times.

Besides those cabinets or chests which are bona fide home freezers, there is the household refrigerator designed primarily for the storage of fresh foods, but which has a low-temperature, frozen food compartment varying in size from 1 to perhaps as much as 4 cu. ft. All mechanical refrigerators now in use have ice making compartments which may be used for storing very small quantities of frozen food which keeps in fairly good condition for a week or two. The new "dual temperature" refrigerator combining fresh food refrigeration with frozen foods storage is in the main merely an enlargement of this principle with one very notable exception: the refrigerator built to combine frozen food and fresh food storage will maintain the proper temperatures in both sections of the cabinet. The frozen food compartment will store frozen foods as efficiently as any home freezer, whereas the freezing compartment of the ordinary mechanical refrigerator does not have a low enough temperature to do this.

The home freezers other than the dual temperature refrigerator and the custom- or home-built walk-in freezers, can be classed in about six categories: (1) Small top-opening or chest-type freezers of from 3 to 5 cu. ft. capacity. There is also a barrel-shaped or cylindrical top-opening freezer that may fall in this class. (2) One-compartment chest-type freezers of medium size, perhaps of from 6 to 10 cu. ft. capacity. (3) Chest-type top-opening freezers having 2, 3 and 4 compartments and a capacity of from 8 to 50 cu. ft. (4) Side-opening freezers which resemble the conventional household refrigerator in appearance. These freezers usually have refrigerated shelves; they vary in size from 6 to perhaps 40 cu. ft. in

capacity. (5) Side-opening combination freezers and coolers having approximately the same size compartments for fresh and frozen food storage. (6) Large pre-fabricated walk-in freezers and combination walk-in coolers and freezers.

Aside from the size of freezer needed, the next most important question a family must decide is whether a top-opening chest-type freezer or a side-opening freezer with shelf or drawer arrangement will best serve their purposes. (The accompanying illustrations show different models of both types.) Each type has certain advantages:

The chest-type freezer with one or more compartments will store a somewhat greater quantity of food than a side-opening freezer of the same interior dimensions, since it contains no shelves or drawers. Less cold air "spills" out of the top-opening chest, and the doors of the top-opening type are less likely to give trouble than doors of certain makes of side-opening freezers.

On the other hand, reaching to the bottom of a chest-type freezer to place or remove packages may be a rather difficult problem for someone who is short and does not have a long arm-reach. The side-opening type of freezer stores packages within easier arm's reach at a level that requires little stooping or bending over. Also, when the shelves of side-opening freezers are refrigerated, there is a larger proportion of freezing surface on which foods can be rapidly frozen than in the chest-types.

Both types of freezers have one common disadvantage: it is sometimes hard to find the package one is looking for in a freezer full of food, a great many of the packages looking alike or similar in size and shape. To facilitate ease of removal, wire baskets or racks have been designed for chest-type freezers into which related or classified foods may be arranged for easy identification. In the side-

opening type with slide-out drawers this problem is also simplified.

Freezer Construction Features

Insulation—Refrigeration engineers have almost unanimously agreed that 4 or 5 inches of cabinet insulation is best for home freezers. If insulation is less, there will be too much heat transfer through the walls of the freezer. As a result of this the motor will keep running a great deal of the time. Besides consuming too much electrical power, the freezer will "sweat," collect moisture on the outside of the cabinet because of condensation of moisture from the air when hot air cools. Insulation of thickness over 5 or 6 inches not only would make the appliance much more costly to you, but would at the same time cut down on the amount of cubic foot storage space available in the same size cabinet; or such thick insulation would make the freezer so wide that it might be impossible to get it through an ordinary door for installation in the home.

Lid Construction—Sweating of a cabinet is also caused by poor lid construction which gives neither adequate insulation over the top of the cabinet in chest-types or over the front of the cabinet in side-opening models, nor a good seal around the opening when closed. The best lid construction is a latching type which compresses a gasket at edge of door or lid to create as nearly a perfect seal against leakage of air as possible. If lids or doors are poorly constructed, frost inside the freezer will collect more rapidly, and the few inches of cabinet space adjacent to door or lid will not be maintained at correct temperatures. This is especially true of chest-type cabinets with poor lid construction, and was the cause of many sad experiences with freezing in converted ice cream cabinets when they were used as a war-emergency measure.

Cabinet Materials—The materials of which the cabinet is constructed should be corrosion-resistant, durable and easy to clean.

Freezing Facilities—Freezing of foods can be done in any home freezer whether or not the cabinet has a special freezing compartment, although if you plan to freeze most of your own foods a freezing compartment is important. But if sharp freezing facilities for freezing large quantities at one time can be used at a local locker plant, the special freezing compartment is not too important. Fast freezing in such compartments is made possible in many home freezers by a regulated temperature control which can be set to −10° to −20° F., or lower, when freezing foods. Reducing the temperature of the freezing compartment is only effective when the freezer has a powerful enough unit to maintain the low temperature throughout the freezing period. When not freezing foods, the special freezing compartment can be used for storage.

Besides low temperatures for freezing, faster freezing in some cabinets is obtained through large areas of special metal freezing plates on which the packages of unfrozen food may be placed. Metal is an excellent conductor of heat.

Faster freezing in some cabinets is also brought about by an air blast from an electric fan which blows over the packages being frozen. The air current set up by the electric fan removes warm air from around the packages of food and replaces it with cold. This is also a good method of fast freezing in home freezers *if* the motor of the electric fan is placed *outside* the cabinet so the motor itself when running does not contribute to the amount of warm air introduced into the freezing compartment.

Temperature Control—A good freezer should have good temperature control, one that will constantly maintain the

temperature at which it is set within two degrees each way, when not freezing foods. Of course, when foods are placed in the freezer for freezing, there will be quite a fluctuation of temperature, but not enough to affect the storage of frozen foods, unless a full freezer load is placed in the cabinet repeatedly every few days or so over a long period of time.

Warning or Alarm System—Some cabinets come equipped with an alarm or warning device; in others it may be purchased as an accessory. In either case it is very important to have the freezer equipped with an alarm or a thermometer which will indicate when the cabinet temperature gets too high because of mechanical or power failure. The alarm system should be operated preferably by batteries so that it will operate even if the freezer is accidentally disconnected or the main power supply fails. Accidental disconnection of the freezer is more likely to go unnoticed than a general power failure, since a power failure causes general trouble and will more often than not be noticed quickly. An efficient alarm system will safeguard large quantities of food.

What About Hazards of Power Failure?

Power failures due to mechanical failure of the freezer, or a break in the current from the service company because of trouble or a storm, are not nearly the hazard one would think offhand. Following is a letter received from a present owner of a home freezer to support this contention:

Beaverton, Oregon
Route 1, Box 871
December 10, 1945

"Would you like to hear about the test my freezer was given the week of December 4, when Oregon had that terrible storm?

"On December 4, a big tree fell across our power line at 3:15 P.M. Due to labor shortage and the vast field of disrupted service, our line was out from 3:15 P.M., Tuesday, until 4:10 P.M., Saturday—in other words 97 hours.

"We did not have all the shelves filled so we were worried—about 25 pounds of meat and chicken remained. We did not open the freezer door until the power came on. By then the water had started to drip from the door. But when we opened the door—to our surprise—the meat was all in good shape—still frozen. The moisture was from surplus ice on walls of freezer.

"We usually kill in January, and fill the locker for the year. If it had been full of meat, I'm sure it would have lasted longer."

(Signed) MR. AND MRS. FRED J. SCHULD

Because of the thick insulation on a home freezer, foods do not thaw out quickly, especially if the freezer is packed solidly full of frozen foods. However, if the freezer contains only a few packages of food, there will be relatively little "hold-over" of refrigeration and packages are likely to thaw quickly.

Some persons feel that power failures are very dangerous, and many can cite examples of foods spoiled because temperatures rose so quickly inside the freezer cabinet when power failed. This, in most instances, was due to the fact that the freezer, having no alarm or warning system, started to get warm long before its owner noticed the packages becoming soft, for it is only when packages in a freezer get to the softening-up stage that the average person can detect warming of the interior of the cabinet due to power failure. Then sometimes it is too late to try to save large quantities of food.

In tests on home freezers, it was found that food in a well-filled 4-cu. ft. freezer did not thaw to any considerable extent until approximately *72 hours*—three days—after the current was off; and the upper layer of packages which would thaw first, did not rise above 32° F. until

(Above) Four-cubic foot freezer by Frigidaire Div., General Motors Corp., is fine example of the small chest type.

(Above Right) Combining household refrigeration and small space for storage of frozen foods, General Electric model features separate doors.

(Right) Adapting freezer design as part of kitchen unit, Schaefer, Inc., shows five-cubic foot Pak-A-Way Model.

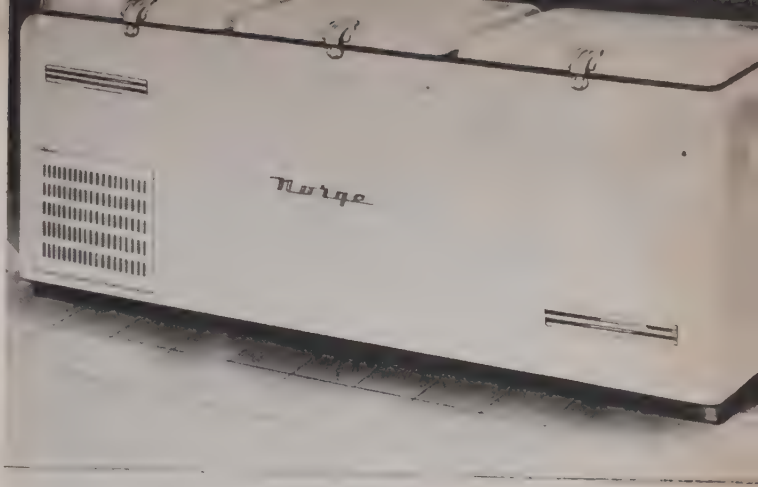
(Left) This Ben Hur freezer is representative of the small two-compartment top-opening chest type of freezer which can be fitted into medium sized kitchens.

(Below) Philco manufactures an efficient side-opening freezer, the inner compartments of which have secondary glass doors. Top compartment for freezing.

(Above Left) Another good example of the upright freezer is the Chapman, each shelf being a freezing plate. Thermometer placed on outside of door indicates internal temperature.

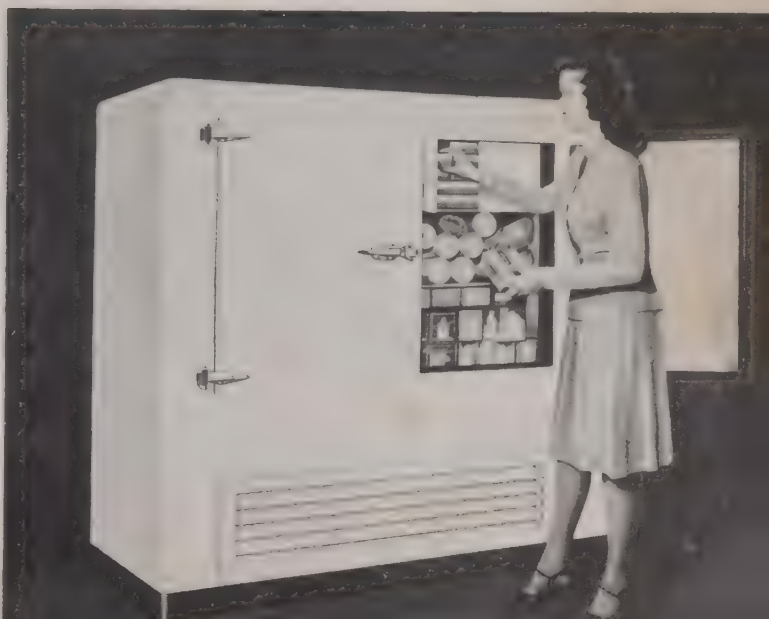
(Left) A typical example of the larger size upright, side-opening freezer is this Portable Elevator Company model pictured. Secondary doors and drawers are a design feature.

The chest type home freezers of larger size are usually manufactured with three or four compartments. The Norge model shown here has the motor unit incorporated in part of the cabinet; top-opening lids are front-latching.

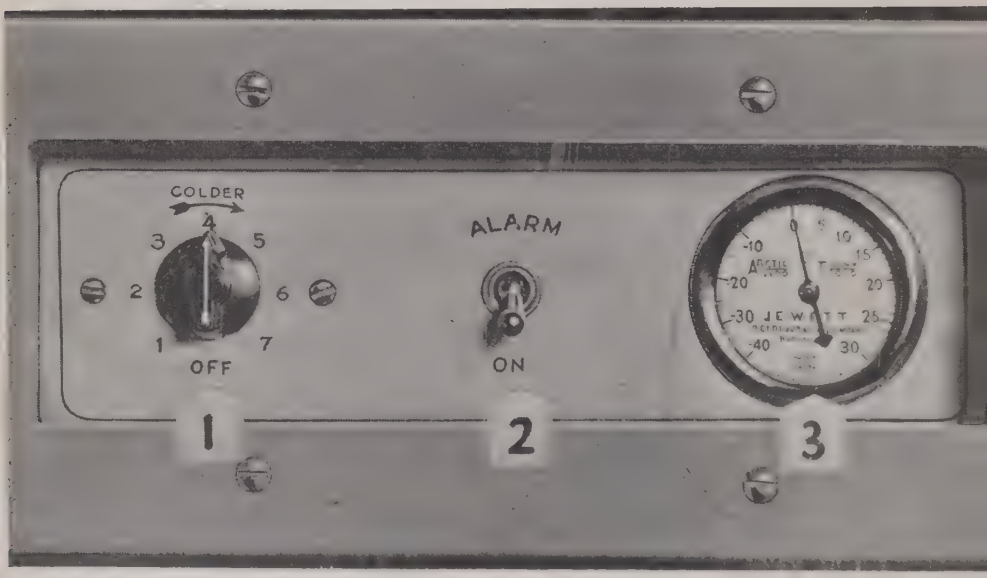


The Steinhorst home freezer is an example showing the motor unit placed outside of the freezer cabinet. Lids are side-opening instead of front-opening as above. Temperature can be regulated simply by turning the thermostat for faster freezing.

Cool storage and frozen storage are combined in the Harder-Tyler model. Left half of cabinet maintains household refrigerator temperatures, accommodating same type of food storage; right half for freezing and frozen storage.



Here is shown a cut-away illustration of the interior of a prefabricated walk-in freezer-cooler manufactured by the Amana Society which gives an excellent idea of how this type of unit can serve all food storage needs for the family living on acreage which produces all or most of the food supply. This model features the walk-in cooler room for storage of foods at a cool temperature (38°–40° F.) and a reach-in freezer for freezing and frozen storage.



Control panel designed and manufactured by the Jewett Refrigerator Company features (1) temperature control dial which regulates internal temperature; (2) alarm switch which notifies owner of power failures; (3) and temperature gauge indicating exact degree of temperature inside cabinet.

after *96 hours*—four days! The bottom layers of packages required more than five days to thaw. These tests were conducted in hot 80° F. summer weather.

Besides the amount of food in a freezer, insulation and the temperature of the weather will affect thawing in a cabinet when power fails. But, in a large cabinet (from 12 to 35 cu. ft., or more) which is nearly full of frozen foods, it is doubtful whether foods would even begin to spoil in less than five days after current is cut off, even in very hot summer weather. From three to five days is usually sufficient to mend the cause of the trouble.

During power failures, do not open doors or lids any more than is absolutely necessary.

Should the trouble last longer than from three to five days, a quantity of Dry Ice placed inside the cabinet right on top of the food will keep it at a low temperature.

What to Do with Thawed Foods

Let us assume that during the absence of the owner, a home freezer has warmed up to the point where some of the food has thawed completely and the remainder is partially thawed. What should be done? Should all of the food be thrown away? Before making a decision about such matters, the condition of the food must be determined.

Although fruits show the effect of thawing more quickly than any other foods, there is little or no danger from food spoilage organisms from eating spoiled frozen fruit. When fruits spoil, they ferment rather than putrefy. Although their flavor will be ruined, they will not become poisonous. Even if they are badly fermented, the worst that can happen is that the juice will become about as intoxicating as new wine. Partly thawed peaches, apricots, plums, and sweet cherries oxidize and become discolored and their

flavor deteriorates. But there is no reason why thawed fruits should not be refrozen, since they are not likely to ferment until their temperature rises above about 40° F. If the quality is doubtful and you do not wish to serve them as dessert fruits, they can be made into jams, jellies, and preserves.

Unlike fruits, meats, poultry, and fish and also non-acid vegetables are subject to putrefactive spoilage. So it is necessary to examine each package carefully before determining what should be done with these thawed products. If the packages still contain some ice crystals, they may be refrozen without risk. If the products have completely thawed, the temperature of each is the best guide to its condition. If the temperature of meats, poultry, and fish is under 50° F., in all probability the food is still in good condition. Spoilage may usually be detected by the odor of the food, although spoilage is not easily noted in this manner in vegetables or shellfish. Bacterial action is relatively rapid in vegetables and shellfish at temperatures of 50° or over. For these reasons it is unwise to refreeze either vegetables or shellfish which are completely defrosted (packages no longer containing any ice crystals). If meats and poultry still have a fresh odor and do not smell sour, they may be cooked and eaten without risk. However, as a precaution, one should cook them thoroughly rather than eat any such foods rare.

If the quantity of fruits, meats, poultry, and fish thawed accidentally is so great they cannot be consumed promptly, they may be refrozen provided the temperature of the food has not gone above 50° F.

Be careful in refreezing foods which have been thawed and do not attempt to refreeze more foods in your freezer than the manufacturer stipulates, otherwise refreezing will take place so slowly that the foods will spoil before

they are refrozen. Most home freezers have a limited freezing capacity, and foods packed solidly in a home freezer will freeze very slowly. It is wise in refreezing any quantity of foods to take them either to a locker plant or a commercial cold storage for refreezing. After they have been rapidly frozen, they may be returned to the home freezer when the temperature of the cabinet is once again operating at 0° F. storage temperature.

If in doubt about any thawed foods, it is better not to take any chances with them, but to discard them or use them for the feeding of domestic animals.

Use and Care Suggestions

CHECK thermometer readings of the inside of the freezer cabinet daily so any failure of power supply or mechanical trouble will not go unnoticed.

KEEP all surfaces of the freezer spotlessly clean by occasionally washing the outside surface as you would the enameled surface of your refrigerator.

PLACE the freezer so that it is convenient for use but at the same time do not place it adjacent to the range in the kitchen nor where the sun will shine directly on it. If the kitchen is large enough, of course, that is the most convenient place for the freezer. If your kitchen will not accommodate the size of the freezer, an enclosed back porch, the basement, an attached garage, or even a separate outbuilding in some cases, can serve as a convenient location for the freezer.

FOLLOW the manufacturer's directions carefully in determining how much food to freeze in your freezer at one time and be careful not to overload the freezer with more unfrozen food than it will safely accommodate.

DEFROST the freezer when frost collects on the inside of the freezer to a thickness where it impedes efficiency of operation. Follow directions given by the manufacturer of your cabinet.

Frequent defrosting of a home freezer will not be necessary since you won't go to the freezer as often as you do your refrigerator. It has been estimated that a refrigerator is opened about 25 times more often than a freezer. Experience in using home freezers has shown that on an average defrosting is necessary about once a year; in some cases it may be desirable to defrost each six months.

Chapter III

YOUR LOCKER MAN AND YOU

Your locker man is a fellow you ought to get to know better. Many's the time he'll be able to do a good turn for you and your home freezer. He's a source of reliable freezing information and the helping hand in most any sort of pinch. He'll supply you with paper and materials for packaging your foods for freezing. He'll age your meat and cut it up. He'll even package your foods and freeze them as well. Sometimes he'll even act as agent for your surplus foods, or provide you with frozen foods you have not been able to freeze yourself. He'll smoke your hams and render your lard, pluck your chickens and dress them. And he'll be a mighty good friend indeed for he, in turn, appreciates your support and patronage.

In a true sense of the word, your locker man is a pioneer who has hewn for himself a permanent place in the community *because* he saw where he could render the community a real service and set about doing it. It's been a lean, hard struggle too, during the war years when it was doubtful what fate the war's end might bring to him and others like him. Would his and their businesses survive postwar manufacture of millions of home freezer cabinets?

In so far as can be determined, the first locker established for rental was in 1908 when the Chico Ice and Cold Storage Company, Chico, California, offered cold storage space for storing meat and other products in boxes. Although special refrigerated rooms with regulation lockers built in tiers were developed and offered for rent through

subsequent years, it was not until the locker man discovered the value of his services in caring for foods as well as storing them that the locker plants started springing up all over the country. Between 1938 and 1940 the number of locker plants in operation in the United States was more than doubled, and on August 1, 1940, there were 2,870 locker plants scattered over 44 states. In the next five years despite curtailed production facilities during the war, locker plants again more than doubled in number, this time over all of the 48 states. A large portion of this latter growth can be ascribed to the fact that in addition to the freezing services rendered to the locker patron, the locker plants performed a vital service to the nation's food preservation program during food-scarce war years.

The future of your locker man to-day looks bright and promising. While he hasn't as yet attained his ultimate goal, his place of business is at least well on its way to becoming the community food preservation center.

He got where he is to-day by dint of conscientious effort to serve and please you with a place to freeze your foods, and a place to store them. He has made himself the watchdog for all your freezing needs and problems. Many times he goes to great length to prove it.

A New England locker operator selected, prepared and froze the entire contents for the locker of one of his patrons over a period of six months—or rather his wife did. Here's the story: There was sickness in this particular patron's family—his wife. It was serious, too, with long hospitalization and convalescence. This happened right at the start of the summer freezing season and it was impossible for the family to fill their almost empty locker. Lockers being at a premium, the patron felt as long as his family would not be able to use it, one of the families on the locker operator's long waiting list should have the opportunity

of using it, food being so scarce that year. But the locker operator felt differently about it. He talked it over with his wife and they decided to keep their patron happy by keeping the locker in question filled until the family could manage this task again themselves. It was one of those neighborly things that happen in small communities where business is on a friendship as well as a business basis. This act of kindness was certainly welcome; and the savings to the locker patron's food budget helped considerably in his crisis. Needless to say that this business man cemented an enduring patronage by performing such helpful service.

This is not the first time attention has been centered on the locker operator's wife as one of his best assets in business. Running a locker plant and serving its patrons seem to be a natural for joint interest and endeavor. Wives know the woman's angle of freezing and using foods which might otherwise be overlooked by the locker operator.

One wonders whether a wife had anything to do with the special wartime service one midwestern locker operator performed for his patrons. It seemed as if patrons who were not low on gasoline supply had tires which were wearing out and they found it increasingly difficult to make frequent trips to the plant to bring their packaged foods in for freezing and storage. Not to be outdone by existing wartime conditions, this operator announced to his patrons that he would furnish transportation to the locker plant for foods which were ready for freezing. At the end of each day he made the rounds and picked up packaged foods; back at the plant they were quickly taken care of so that no food was wasted or spoiled. This performance was not only a contribution of service to his customers, but a big contribution to the war effort.

An operator of a plant in the Pacific northwest has made an outstanding contribution to the needs of his locker patrons by working out a buying schedule for their meat requirements. Prior to his taking over the locker plant, he had been operating a large meat market, so he knew approximately how much meat each locker patron would have to freeze to supply families of from three to eight persons. Not wishing to risk any ill will or dissatisfied customers, he even tested out the meat schedules so his advice would not be mere paper theory. As a result of his efforts, his meat purchasing schedules represent real economy to the locker patrons because they not only make full use of the locker space rented, but provide a year-round meat supply purchased at the most economical prices.

Not all locker plants are able to perform all services; it depends in great measure upon their location, their patronage, the cost of the service to you, and the kind of business your locker man is in.

If he is in the creamery or refrigerated warehouse business and operates the locker plant as a sideline, chances are you will have to provide your own food freezing services. If his business is a retail establishment such as a grocery store or meat market with the locker business as a sideline, in all probability he will furnish a meat cutting service and possibly a meat curing or packaging service.

However, if your locker man is operating the locker plant as his sole or major business, and has designed his plant to give freezing services as well as locker space for storage, he is in position to furnish you with meat chilling, aging, curing of hams and bacon, rendering of lard, making of sausage, and many other affiliated services. A few plants even have slaughtering facilities; many others make arrangements for meat supply and the slaughtering

Among the foremost meat freezing services performed by locker plants for locker patrons and owners of home freezers, are chilling (upper right); aging meats; curing meats (upper left); cutting and boning meats (lower left); grinding and packaging meats (lower right). *Photos upper left and upper right, courtesy of the Armstrong Cork Company. Photos lower left and lower right, courtesy of the General Electric Company*

Showing newest trend in locker systems of eliminating necessity for patrons or attendants to enter cold rooms to freeze foods or take products from storage. At left is new type of locker system (*photo courtesy Iceberg Refrigerated Locker Systems*) which may be installed in basement of apartment houses. Below is new type of locker freezing units (*photo courtesy Frigidaire Division, General Motors Corp.*) where foods are frozen on shelves in individual freezing chambers.

Most common type of lockers in use. Photo above (*courtesy Armstrong Cork Co.*) shows the frozen products which have been brought from freezing room in insulated cart being placed in patron's locker by locker attendant. Photo right (*courtesy Armstrong Cork Co.*) shows patrons removing food from storage in two different types of lockers: the door-opening in upper part of photo; the drawer-opening in lower front of photo.

of it elsewhere. Your locker man may also offer a complete poultry freezing service which is a welcome one when a quantity of chickens are to be frozen. With his equipment he can much more quickly and efficiently pluck, dress and package poultry than you can do it at home.

There are very few locker plants offering fruit and vegetable preparation service. There are several reasons for this: Up to now, more meats are frozen and stored at locker plants than any other food, although of recent years more persons are freezing fruits and vegetables than ever before. But it still remains questionable to your locker man whether or not he can afford to install complete equipment for fruit and vegetable preparation and whether you could afford or *want* to pay the relatively high service charge which he must get for performing this service for you. For complete processing of fruits and vegetables, including the cost of the packaging materials, your locker man has to charge around 12 to 15 cents per pound of produce. Many women feel they would just as soon prepare their fruits and vegetables at home, since it doesn't require any special equipment like meat does, and save this additional cost price of their frozen produce. Where such fruit and vegetable processing is offered, there is no question but what it saves you much time and trouble, especially where large quantities of either of these products are frozen. In those areas where large quantities of garden produce are grown you will find an increasing number of locker patrons taking advantage of fruit and vegetable preparation facilities offered by the local locker plant. This service may be one of two kinds: (1) a complete preparation service and freezing, sometimes under the direction of a competent woman schooled in the procedure; (2) kitchen facilities where locker patrons may bring their produce and prepare their fruits and vegetables on the premises.

The latest locker plant development which seems to have many advantages, is a *branch-locker* operation combining the advantages of a small non-service unit with those of a complete freezing preservation unit. In small outlying communities where volume of business would not justify investment in equipment for a complete processing service for all types of foods, branch locker-rooms with a capacity of from 50 to 250 lockers are built which are part of a large-scale association having a central plant where all services are performed for any patrons of the branch locker-rooms. Foods for processing are taken to the central plant where they are prepared, packaged, and quick frozen; they are then returned to the local locker-room for storage.

A Baker's-Dozen Helps from Your Locker Man

Here are a baker's-dozen ways your locker man may be of help to you and your food freezing problems. As stated previously, not all of the food processing services may be available from your locker man, but in most instances many of them will be.

Source of Supply for Foods—Both Fresh and Frozen: In case you do not have a sufficient supply of home-grown foods to freeze, your locker man will be a good source of information for the names of those farmers or produce growers where home-grown food can be purchased in sufficient quantity to meet your needs.

Many times he also will have in stock commercially prepared fruits or vegetables, fish and shellfish—foods which are not ordinarily grown locally—which can be purchased by the dozen or half-case lots to supplement your own frozen food supply.

Source of Supply for Packaging Materials: Your locker man can usually be relied upon to keep a good supply of

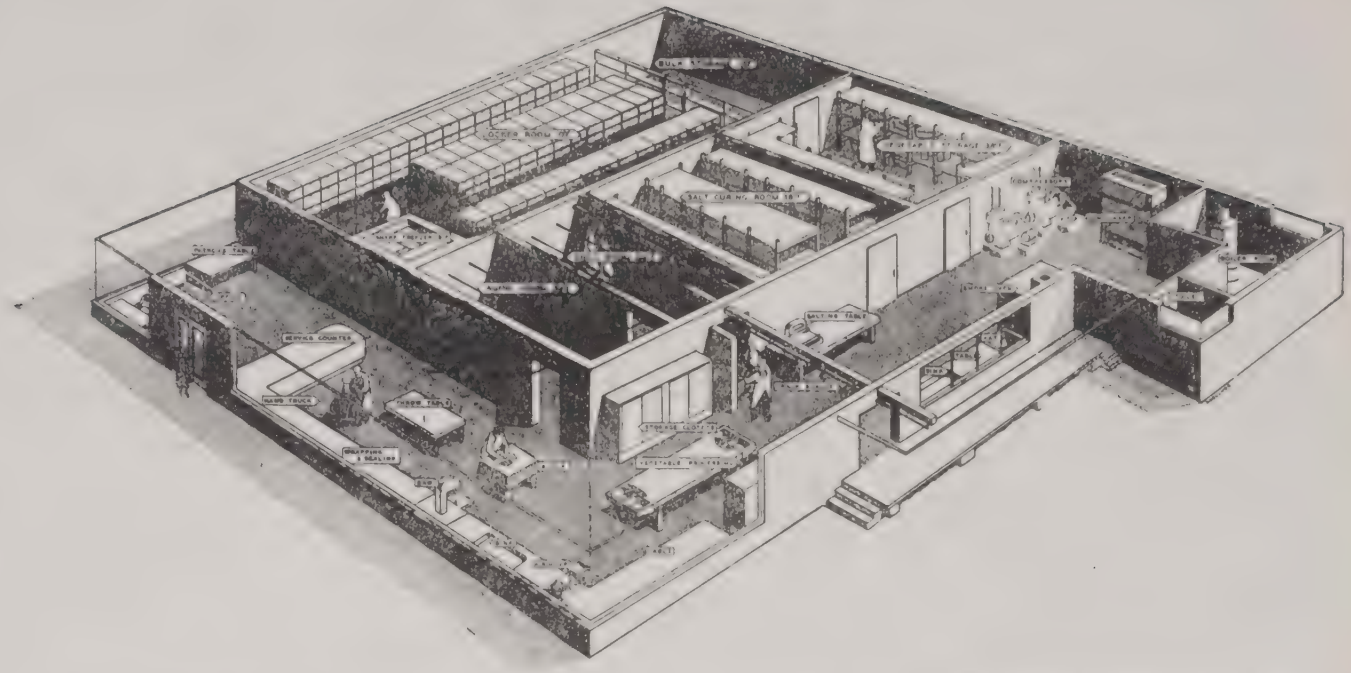


Photo courtesy Tennessee Valley Authority

Efficient floor plan, showing operation of a complete locker plant offering many types of service to locker patrons: meat chilling, aging, cutting, wrapping, and freezing; meat curing and smoking; meat grinding; vegetable preparation; cool vegetable storage; and frozen bulk storage. Tiers of lockers in locker room are located within easy access of entrance to plant.

packaging materials on hand for sale to all persons who freeze foods. He can also render good advice on the merits of the various kinds of cartons, containers, and sheetings or wrappings for use with different foods.

For Fast Freezing Large Quantities: The freezing capacity of any home freezer is limited by its size; that is, no more than a given quantity of foods can be placed in a home freezer at one time for freezing. If you attempt to freeze more than the recommended amount at one time, freezing takes place too slowly and you are likely to encounter losses through spoilage. So it is not only desirable, but oftentimes necessary, to take large lots of packaged foods to your locker man for fast freezing by means of the freezing equipment he has on hand for this purpose. His charges for freezing foods for you are small: from one cent per pound to slightly more. Where a complete meat freezing service is rendered—chilling, aging, cutting, and packaging—the cost of freezing the meat is usually included in the cost of overall handling.

Provides Auxiliary Frozen Storage: It is an all too common experience that no matter what size home freezer you buy, it never seems quite large enough to *always* meet all of your frozen storage needs. Part of the economy of having freezing facilities is to have, or provide through an auxiliary locker, ample storage to permit the purchase of "bargain" foods in quantity lots, as well as foods in peak season when market prices are low. Oftentimes it is impractical to store large quantities of meat or wild game such as deer or elk in a home freezer when its size will barely accommodate the every-day needs of the family.

These and many other instances are typical of the need for auxiliary storage space which your locker man is able to supply at a cost you cannot afford *not* to take advantage of when one considers that his rental charge per month is

the approximate cost of one rather small steak or roast. Computed on this basis, the saving on food by using a rented locker for storage of the overflow from the home freezer is not a matter of minor importance.

Survey studies on costs and savings of locker users reveal some interesting data: Locker rentals average from $12 to $15 per year; locker users save upwards of an estimated $100 per year on their food budgets *while their meat consumption increases from 30 to 50 per cent!* Conclusive proof, it seems, that you can eat better at less cost with freezing facilities.

A Standby for Prolonged Power Failure: The refrigerating engineering knowledge that has gone into the manufacture of home freezers does not make mechanical trouble a likelihood. But there are times when electrical power is disrupted due to a severe storm or some other such unavoidable difficulty. While actual tests have proved (see p. 23) that power failures over a short period of time are not particularly hazardous, there is no mistaking the danger of a prolonged power failure. At such times your locker man is sorely needed as a standby for the safekeeping of your foodstuffs. Also, when power failures of short duration occur and the temperature of a large quantity of frozen packages rises much above 15° or 20° F., it is advisable to take the contents of your home freezer to your locker man for a few hours of sharp freezing at low temperatures to bring the temperature of the foods down as quickly as possible. It would take a small home freezer a long time to do this and there might be danger of spoilage, or at best a greatly deteriorated product.

Aging Beef Carcasses: One of the services which many locker plants offer and which it is almost impossible to do yourself unless it is late fall or winter and you live on a farm, is the proper aging of beef carcasses (and mutton,

when it is so desired). Admittedly, one of the things that produces fine flavor and tender texture in a choice steak is the aging of the carcass before it is sold at retail or packaged for freezing. (The humidity and temperature factors affecting good aging of beef are covered in a later chapter.) This is one service your locker man can do well for you, and you will do well to let him.

Chilling, Cutting, Grinding, Wrapping Meats: If you live on the farm and already have the necessary equipment and have had experience in slaughtering, you may not need the locker man's service for chilling, cutting, grinding, and packaging meats. But for all others this is a service performed by your locker man that can actually save you many, many times the small cost he charges to do it for you. For unless you are experienced, you are liable to waste a large portion of your meat by not cutting it up properly; and if it isn't properly chilled before you cut it up, it is likely to be lost through spoilage. Besides, the meat saw, boning knives, meat grinder, etc., needed to do the job at home are expensive equipment which would add materially to the original cost of your meat if it had to be purchased.

The cost of chilling, cutting, wrapping, and freezing meat averages about $1.65 per hundredweight, or one and two-thirds cents per pound. The cost of grinding meat is usually in addition to the other cost of handling; about $1.27 average per hundredweight.

Curing Meats: When whole or half carcasses are bought and you wish to make the most of each portion of your purchase, you will find the curing and smoking service offered by your locker man a real help, for in all probability you will want ham and bacon as well as roasts and steaks and chopped meat. He charges on an average of $3.15 per hundredweight to cure meats; $1.68, to smoke

them. Even those persons raising their own meat animals and who already have a smokehouse, often find it advantageous to turn this rather tedious task over to their locker man.

Making Sausage: Here again, this service will help you utilize to the fullest your investment in a carcass of meat. Sausage making is tricky unless you have had experience, and since your locker man is undoubtedly experienced with making it, better let him do it well and pay him the penny or more per pound he asks for his services.

Rendering Lard: Even when equipment is available for rendering lard on the farm or in rural communities, no woman would prefer doing it if she didn't have to, especially when your locker man only charges an average of $2.40 per hundredweight for rendering it for you. It is not nearly the arduous chore for him as it is for you under home conditions.

Plucking, Dressing, Packaging Poultry: Poultry picking machines are usually installed where this service is available, and in less time than it takes to tell about it, a bird can be picked clean. As a matter of fact, locker attendants work so fast and efficiently doing this service for you that a dozen birds can be plucked, dressed, and packaged for the freezer while you manage to do several. If you are in the habit of having your butcher dress and cut up your chickens for you, you certainly will welcome the locker man who is equipped to do the same service.

Preparing and Freezing Fruits and Vegetables: As previously mentioned, prices charged by your locker man for preparing and packaging fruits and vegetables may be slightly higher than you feel this service warrants. This is especially true where you are freezing only a few packages at a time. However, for large quantities of produce, no

price is too high if you do not have the time nor the place nor the inclination to do it yourself.

Kitchen Facilities for Do-It-Yourself: Locker patrons find kitchen facilities at the locker plant very convenient, in the few locker plants where such is available. It is sometimes easier for patrons to transport bulk fruits and vegetables before starting to prepare them for freezing than to transport the packaged product for freezing.

How to Be a Good Locker Patron

Talk to any groceryman, when he is off duty, and you'll find he has a host of small *and real* grievances against the women who pinch his fruit and bruise it, who finger this and finger that, who distrust his veracity when he recommends the food on his shelf, or who think he doesn't give them full measure on his scales. Well, your locker man has his pet grievances too, first and foremost among which are "lost keys." Not all lost keys are lost, so the locker man thinks; you just forget to bring it on that particular trip to your locker. The fact that keys are easily lost and when they are, your locker is vulnerable to the finder, really does cause the locker man a lot of trouble. So if you will guard your locker key with the same tenacity as you do the key to your bank's safety deposit box which you rent, things will run smoother for your locker man and he will be able to give you better service.

Also, remember the locker man is entitled to keep regular hours the same as any other business man, so time your trips to your locker during hours; barring emergencies, don't arrive after hours and expect service if he's still there.

You've got to trust your locker man the same as you do the integrity of your butcher or grocer—perhaps more so. For you put a carcass of meat in his care and you will not

get the same number of pounds of edible meat as carcass meat because bones, trimmings, fat, and inedible portions account for almost half of a carcass weight.

It is good advice also to listen to your locker man's suggestions for the quantities of food your locker will accommodate. If you freeze more food than your locker will hold, it means considerable trouble for him to store such surplus in another place when no other storage space is available.

A Message to Locker Operators and Attendants

Turn about is fair play, and after telling your locker patron how to be a good locker patron, here is a miscellany of tips on how you can be a *better* locker operator or attendant, for the success of your business lies in the thoughtfulness and efficiency of your services.

The first thing patrons expect from their locker man is a big helping of courtesy; in addition, it's the least expensive service you can offer to all parties concerned and will bring in some of the greatest profits.

Another significant item you may overlook is the fact that for every man who rents a locker from you there is almost always a woman who makes frequent trips to it. She watches the way you keep house, and she may be supercritical of the way you do it. Perhaps she has a right to be very critical of the cleanliness of your place of business, for it is *her* food you are handling or keeping for her, and its sanitation is dependent upon the way *you* care for it. She is the protector of her family's health and she wants you to be the protector of their food she entrusts to your care.

Making her comfortable is perhaps the next best thing to win her confidence and friendship. Here it is the little things that count, like providing her with a basket to

carry her packages to and from the locker, or giving her a coat to put on over a sheer summer dress when she wants to go into the zero storage room.

Expedite her food processing when she brings it to you; don't let a patron's food stand waiting for attention, handle it as carefully and as efficiently as if it were your own. Get meat animals ready for the chill room as quickly as possible. Pick and dress poultry immediately. If fruits and vegetables cannot be taken care of when they are brought to the plant, at least place them under refrigeration until you are able to do so. Vegetables allowed to wilt lose much of their goodness and vitamin content; fruit allowed to stand at warm temperatures is likely to get soft and mushy.

Deserve her trust in you by being honest in all things and as well informed about freezing procedures as possible. You are the logical one for her to turn to when she encounters a problem for which she cannot know the answer.

Don't let patrons down with inferior packaging or inferior packaging supplies. Make certain that the wraps you use on meats are moisture-vaporproof and will give food the needed protection. Don't be afraid to spend the extra few cents for *good* packaging materials whether you use them on patrons' food or sell the wrappings to them. No cost of packaging materials can compare with the cost of foods lost through improper packaging.

Listen to locker patrons' complaints or suggestions when they have any to offer; an attentive ear can lead the way to vast improvements in your business.

If a service is offered, completely equip such service with the proper equipment so you will be performing the best possible service for your patron and it will be worth the money paid you to do it.

Maintain your storage locker rooms at 0° F., not 5°, 10° or 15° F. It has definitely been established through tests that foods will not keep as long nor as well at the higher temperatures.

Be on constant watch for your patrons' interests and be on the lookout for new ways to serve the community with your present facilities. There are usually restaurants and institutions who need space for bulk storage—both refrigerated and frozen. There may be farm customers who would welcome a place for shell egg storage. Such a room, however, should be separate, for eggs pick up odors and flavors easily; humidity and temperature must be carefully controlled for this kind of storage: optimum relative humidity should be 85 to 90 per cent—temperature should be near 32° F. Then eggs will store almost perfectly for three months or more. There are many commercially prepared frozen foods which you can buy and resell to your patrons which they cannot buy and freeze themselves; such foods include orange juice, fish not native to the locality, shellfish, vegetables and fruits not produced locally, etc. You can hang an announcement board on which information can be posted telling what foods to freeze, when foods are best to freeze, when meats can be bought at worth-while savings. You could even conduct a Frozen Food Surplus Exchange on such an announcement board for use of your locker patrons who find they have frozen too much of one vegetable and would like to exchange this surplus with someone who froze too many fruits.

As a last tip to operators and attendants of locker plants, let us ask a question: Have you ever watched your mother when the front door bell rings? If her apron is soiled, she hastily removes it; if a wisp of hair has fallen over her forehead, she quickly tucks it back in place; if

her house dress is not clean and tidy, you can see the wish forming in her eyes that it were as her hands unconsciously smooth down the wrinkles and rub over the soil. She has work to do the same as you, but she always manages to put her best foot forward by way of a clean, neat appearance because she knows others judge the kind of housekeeper she is by the appearance she makes. So it is with you who must greet visitors, or be prepared to greet them throughout the business day. Your personal appearance can invite business, or reject it.

Chapter IV

A 4-POINT PROGRAM FOR FREEZER SPACE

The four walls of a freezer will not budge
So don't for the freezer hold a grudge
If you the interior quickly expend,
And if you the interior foolishly spend.

The luxury of having a home freezer or freezer space at the locker plant—or both, is never overshadowed by the practical side of the picture. But the practical side has to be considered. A freezer has to be managed just like family finances, otherwise you're liable to get "all balled up"; your freezer space and all the food you want to freeze just won't come out even. Halfway through the summer you're likely to find the freezer loaded to capacity with many fruits and vegetables still to be frozen and no place to freeze them.

Those experienced in the every-day use of freezers can only offer guideposts for the inexperienced because what you do with your freezer space is dependent upon a number of things: to what extent you want frozen foods to supply the family food needs; the size of your family and freezer space; family likes and dislikes; the kind and quantity of home-grown foods available; the cost and quality of market foods; the amount of entertaining you normally do which might be a drain on the contents of the freezer; etc.

Managing the freezer can best be accomplished with a program, well defined and outlined *on paper* before the

spring planting season begins, because you will want to grow those varieties of vegetables which are best for freezing. File your freezer program for safe keeping, not only to refer to occasionally to check on how it applies in actual application of your food needs, but also to use in preparing the succeeding year's program.

Here is a 4-point program which can be used as the structural basis for any size freezer and any size family:

1. Freeze those foods at hand.
2. Freeze what you use.
3. Need what you freeze.
4. Confine "Specials" to leftover space.

Detailed information for your program will have to be supplied by yourself, but here are the "ifs" you will find it profitable to check on beforehand in making out your program so that you reap a decided profit from your investment.

Freeze Those Foods at Hand

Common sense dictates that if you have a subsistence garden—a small plot which provides home-grown vegetables for the summer plus a surplus—it would be foolhardy to fill your freezer with market-bought fruits and meats while your surplus vegetables possibly go to waste. So the first step in preparing your program will be to take an inventory of those foods which you grow yourself or which are grown locally.

If you live in the city and have had a home garden plot, there is every reason why you might wish to continue gardening to provide a portion of the family food needs and freezing the surplus vegetables. Gardening becomes profitable when the gardener becomes experienced; successful gardening represents a real saving of dollars and

cents; and, to some, it provides a hobby which in turn provides much-needed exercise and sunshine. If the size of your freezer will accommodate meat as well as all the surplus vegetables you grow, it might be a wise investment to purchase commercial meat cuts (whole loins, rounds, quarters, etc.) which can then be cut into family size pieces, wrapped, and frozen. The purchase of meats in this manner can represent quite a saving over buying individual cuts as they are needed. The purchase of poultry does not net the saving that meat will; besides, if roasting chickens are frozen, they take up considerable space, space which can be more profitably devoted to other foods in a small freezer.

If you live in a suburban community or a rural town, you will have at hand many more foods which will be profitable to freeze. If you do not grow your own vegetables, there no doubt is someone you know who does, from whom you can buy what is needed for freezing purposes at very reasonable prices. If you grow berries and have several fruit trees, it will be profitable for you to provide freezer space for these foods. Many times, also, there is an orchard in the vicinity, or a produce man with whom you can deal directly to be assured of a saving and good fruit at the proper stage of maturity for freezing. If you wish to freeze meats, you may again be able to deal directly with the man who raises meat animals and poultry. But remember that a 6-cu. ft. freezer will hold only 210 to 270 pounds of meat—or—from 160 to 324 pint packages of fruits and vegetables at one time. This amount of freezer space will not hold an ample supply of *all* these to provide all the meat, vegetable, and fruit requirements for a family of five during the non-productive months of the year. So, in order to make the most practical use of freezer space, decide which of these foods represent the

greatest savings; or, arrange to supplement your freezer space with additional storage at the local locker plant if you decide they are all profitable and you wish to freeze meats, vegetables, and fruits.

Some farm families who look to the freezer for all their perishable food needs during the non-productive months of the year, already have invested in *two* freezers, having found that ample freezer space is not only to be desired, but it pays big dividends. Other farm families, besides having a big home freezer, supplement their freezer space with locker plant storage. So, if you live on a bona fide farm, whether you class yourself as a gentleman farmer or a dirt farmer, there is either sufficient surplus food grown or raised right on the premises, or what is raised can be supplemented by trade or purchase from neighbors, to freeze enough food to supply all the vegetables, fruits, and meats needed for the months when the produce is not available fresh *plus* special perishable foods such as baked goods, ice cream, dairy products.

Freeze What You Use

Food in the freezer not used is freezer space not bringing profit to your freezer investment. So when you have determined what kinds of food the size of your freezer will accommodate and what foods are readily available, the next step is to determine as nearly as possible the frequency of use of each food based upon the family's food habits and their likes and dislikes.

You are likely to find both food habits and food preferences gradually alter with the advent of frozen foods into your family life, especially with respect to vegetables and, in many instances, fruits. Freezing can initiate new frozen vegetable tastes into the family food picture to give the wide range of variety which has been lacking dur-

ing non-productive months in those areas not served by city market fresh vegetables. All areas are virtually devoid of locally grown fresh fruits during many months of the year, and frozen fruits in the freezer will probably prompt you to serve fruits more often for dessert purposes.

The most popular vegetables will represent the biggest proportion of the vegetables you freeze. But in any case, reserve some small space for a few packages of those vegetables served rarely, or not at all. Try them out the first year to see if the family likes the flavor of the frozen product, because freezing seems to improve the flavor of some of the less desirable vegetables, especially strong vegetables such as parsnips, making them more mild and pleasing in taste to the average person.

Readjust your program from year to year to cater to the changing food habits, the likes and dislikes of your family.

Need What You Freeze

Merely to guess in what proportion you will need vegetables and fruits and how many packages of each kind to freeze, is not good freezer management. If you have never frozen foods before, try to calculate the frequency these foods are served by studying your grocery slips or your daily menus if you have a bookkeeping system for your kitchen. Or, over a period of a month keep an accurate account of how often vegetables and fruits are served in your household, what kind of each are served, and make your calculations from that.

The foods on a grocer's shelf which make the best profit for him are those which have a fairly rapid "turnover," quick purchase and sale. So it is with freezing space, but the turnover is not as frequent because your aim is to make your supply last until the food you are using is again avail-

able in fresh form. But at such time you also want your preserved supply to be exhausted, or nearly so.

A good general rule to adhere to in using fruits and vegetables from the freezer is this: Do not use any of your preserved products as long as any fresh fruit or vegetable is available in your garden or orchard, or when they can be bought at low, "in season" market prices. Start using your preserved supply as soon as the fresh is not to be had under these conditions.

When meats are frozen, they can be used continuously throughout the year because they are always available. As soon as the frozen supply is exhausted, or nearly so, more can be slaughtered or purchased to refill the freezer space allotted to this food.

By managing your freezer in this way, you operate on a rotating freezer budget: putting foods in or taking foods out almost every month of the year. Such a rotating budget will keep your freezer full, or nearly full at all times.

Store "Specials" in Leftover Space

The larger your freezer, the wider range of foods you will be able to freeze and store, and the more nearly your freezer can come to supplying all the perishable food needs of the family when fresh is not available. The list of foods you can freeze is long: besides meat, vegetables, and fruits, there are poultry, fish, shellfish, wild game, dairy products, baked goods, cooked foods, and ice cream.

However, where freezer space is limited, it is wise practice *not* to sacrifice any space to the "specials" (such as cooked foods) at the expense of the staple foods. As the freezer empties there is plenty of opportunity to use this empty space for storing a quantity of ice cream, or a few pies, cakes, rolls, cooked dishes, etc.

Since it is practicable to freeze dairy products only in

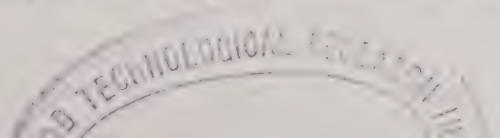
anticipation of those few months when the supply is lean, space can usually be found to freeze sufficient surplus eggs, cream, and butter for this purpose when desired.

Because broiling and frying chickens can be slaughtered fresh only a few months of the year (unless poultry is raised to mature every few weeks during spring, summer, and early fall), it might be wise practice to freeze the bulk of your poultry as broilers and fryers. Fowl for roasting and fricassee can easily be had fresh-killed almost any time of the year whether you buy or raise poultry.

Suggested Freezer Budgets

Taking into consideration that home-grown vegetables and fruits and farm-raised meats (or the purchase of commercial cuts at a saving) represent the greatest economy in a freezer food budget, we have prepared the following suggested freezer budgets based on the 4-point program just outlined.

The aim of each of these budgets is to provide during the non-productive months as nearly as possible for the food needs of the family for those foods grown or found at hand locally. In budget number three, for example, if the contents of a 6-cu. ft. freezer is confined to home-grown garden products (mostly vegetables, a few strawberries, rhubarb, cherries, or raspberries) a family of four can draw on the freezer and from their garden for their entire supply of vegetables for the whole year. The same freezer space could be devoted to a fairly wide range of fruits as well as vegetables, but quantity would be sacrificed and the supply would only partially fill a family's fruit and vegetable needs for the approximate eight months when these foods are not available fresh. Also the fact must be considered that in most instances fruit such as peaches, apricots, raspberries, blueberries must be purchased. So it may be



wise where freezer space is limited to make the most of your home-grown foods; then, as these foods are used and when freezer space permits, supplement your home-preserved supply with commercial bulk purchases (one dozen packages, or more) of fruits. In cases where expensive fruit has to be purchased and freezer space is limited, you will find it just as economical considering cost, materials, and time involved, to contact a dealer in frozen foods and make arrangements to buy a quantity of commercially prepared fruits.

When a freezer is filled with home-grown garden produce, the freezer space provided as these products are used will allow for the freezing of bulk purchases of meats which can either be purchased already prepared and frozen, or in the commercial cuts mentioned previously.

Using every bit of freezer space all the time represents the greatest savings on food costs.

How you package your foods also can mean either economy or wastefulness. If they are bulky, they naturally are not economical of freezer space; if the packages are cylindrical instead of rectangular, they also take up more space. The number of pint packages of frozen foods which can be placed in a standard-size locker (18 by 20 by 30 inches) varies from about 160 to 324, depending on the shape of the carton. If rectangular cartons are used, an average of 300 pints or 150 quarts can be put into such a locker. The number fitting into a home freezer is approximately the same.

The budgets listed here represent rectangular cartons and containers for fruits and vegetables.

BUDGET NO. I—4 CU. FT.
(Family Of 4)

Monthly Rotating Storage Supply

Quantity		Product	Prepared Weight, Lbs.
4		4-lb. Roasts: beef	16
2		2½-lb. Steaks: sirloin, etc.	5
1½		Loins: lamb, veal, pork	20
1		Ham	12
8		Fish Fillets	8
2		Frying Chickens	4
4	Pts.	Broccoli	
6	"	Asparagus	
4	"	Spinach	
12	"	Sweet Corn	
6	"	Lima Beans	
12	"	Peas	
6	"	Green Beans	
4	"	Cauliflower	
10	"	Carrots	
8	Pkgs.	Corn on Cob	
10	Pts.	Strawberries	
3	"	Blueberries	
10	"	Red Raspberries	
9	"	Peaches	
2	"	Rhubarb	
2	"	Apple	

Explanation: The fruit and vegetable budget allows the purchase of commercially prepared packages by the dozen, to replenish the supply as they are needed; it allows for slightly more than two packages of vegetables each day, and slightly more than one fruit, allowing for the occasions when two packages may be needed. The meat budget allows for one roast per week, with slight allowance for second meal servings from the roasts; steak twice during the month; ham (using top three slices for separate meals) six times during the month; fish once a week; and loins (as chops, or pork roasts) to fill in for other meals. This budget allows occasional freezer space for extras, such as ice cream, a pie or two, or bread, leftovers, etc.

BUDGET NO. II—4 CU. FT.
(Family Of 4)

THREE-MONTH SUPPLY MEATS ONLY

Quantity	Product	Prepared Weight, Lbs.
8	5½-lb. Roasts	44
2	Loins: veal, pork	30
2	Hams	22
2	Legs of Lamb	14
12	2½-lb. Steaks	30
6	Frying Chickens	12
3	Roasting Chickens	10

Explanation: Roasts could be oven or pot roasts; loins could be cut into chops or, in the case of pork and veal, into roasts and chops; ham could be partly sliced (about three top slices) and remainder could be baked, etc. As soon as one kind of meat supply is exhausted, it can be replenished—or—surplus space could be used to freeze occasional baked goods, surplus fruits or vegetables, ice cream storage, etc. Meat servings from this budget approximate one roast weekly, with the roast used for a second meal; ham once a week; leg of lamb occasionally, with sufficient supply for a second meal from each; steak once a week; fried chicken every other week; roast chicken once a month; and meat from loins to supply meals in between as broiled or pan-fried chops, etc.

BUDGET NO. III—6 CU. FT.
(Family Of 4 Or 5)

HOME-GROWN PRODUCE

Month	Product	Prepared Pts.
May–June	Asparagus	15
	Rhubarb	10
June	Strawberries	30
June–July	Cherries	10
	Peas	30
June–Oct.	Spinach, Other greens	30
July	Raspberries, Other berries	20
	Gooseberries	5
July–Aug.	Green Beans	30
July–Sept.	Cauliflower	15
July–Oct.	Broccoli	15
Aug–Sept.	Lima Beans	20
	Peaches	20
	Sweet Corn	45
Sept.–Oct.	Pumpkin	5

Explanation: Any home- or locally-grown fruits or vegetables in this budget may be substituted for those listed which may not be readily available. The budget is designed for use only when fresh fruits and vegetables are out of season (approximately eight months) and should be supplemented by those root vegetables and fruits which can be cellar-stored. Use both fruits and vegetables continuously during non-productive months; if additional are needed before the next producing season, purchase commercially prepared products by the dozen or half-dozen packages. As the freezer empties, surplus space can be used for freezing commercial cuts of meat (beef round, pork loin, etc.) or the freezing of baked goods or storage of ice cream, etc.

BUDGET NO. IV—6 CU. FT.
(Family Of 4 Or 5)

Continuous Meat Supply Only

Month	Product	Prepared Weight,* Lbs.
July	Beef (1 quarter)	100
Sept.	Lamb (1 carcass)	50
Nov.	Pork (2 hogs) (or 1/2 hog and 1 veal calf)	200†
Jan.	Beef (2 quarters)	200
March	Pork (1 hog)	100†
May	Veal (1 calf)	100

* A carcass dresses out to about 50% of its original weight by the time it is trimmed, boned, etc., and ready for the freezer.

† A portion of this meat would be cured for use as hams, bacons, etc.

Explanation: This budget is designed to be drawn on continuously for the entire meat supply for the family. Upon occasion there will be small surplus freezer space which can be used for ice cream, left-overs, baked goods, and cooked foods; or, if there is a good source of supply of fish, either fresh or commercially frozen, the surplus freezer space could be used to supply in great part the family's needs of this food.

BUDGET NO. V—12 CU. FT.
(Family Of 4 To 6)

FRUIT, VEGETABLE, AND MEAT SUPPLY

Month	Produce	Prepared Pts. or Lbs.*
Jan.	Beef (2 quarters)	200 Lbs.
March	Pork (1 hog)	100 "†
May	Veal (1 calf)	100 "
May–June	Asparagus	15 Pts.
June	Strawberries	30 "
	Chickens (12 broilers)	16 Lbs.
June–July	Peas	30 Pts.
	Rhubarb	10 "
June–Oct.	Spinach, Other greens	30 "
July	Raspberries, Other berries	30 "
	Chickens (24 fryers)	48 Lbs.
	Beef (1 quarter)	100 "
July–Aug.	Green Beans	30 Pts.
July–Sept.	Cauliflower, or Mixed Veg.	15 "
July–Oct.	Broccoli, or Carrots	15 "
Aug.–Sept.	Sweet Corn	45 "
	Peaches	20 "
	Assorted Fruit Purées	10 "
	Lima and Shell Beans	10 "
Sept.	Lamb (1 carcass)	50 Lbs.
Oct.	Pumpkin, or Squash	10 Pts.
Nov.	Pork (1 hog)	100 Lbs.†

* A carcass dresses out to about 50% of its original weight by the time it is trimmed, boned, etc., and ready for the freezer.

† A portion of this meat would be cured for use as hams, bacons, etc.

Explanation: The fruits and vegetables in this budget are to be used as soon as fresh produce is no longer available from garden or local markets, to be replenished if need be before the next producing season with commercially prepared frozen fruits and vegetables purchased in dozen lots. The meat supply should be drawn on continuously to supply all the meat needs. As the freezer empties, surplus space may be utilized with fish, leftovers, baked goods, cooked foods, ice cream, etc.

BUDGET NO. VI—24 CU. FT.
(Family Of 6 To 8)

FRUITS, VEGETABLES, MEATS, POULTRY, FISH

Month	Product	Prepared Pts. or Lbs.*
Jan.	Beef (1 quarter)	100 Lbs.
Feb.	Fish	26 "
	Ice Cream	3 Gal.
March	Pork (1 hog)	100 Lbs.†
April	Fish	26 "
May	Ice Cream	3 Gal.
	Veal (1 calf)	100 Lbs.
May–June	Asparagus	15 Pts.
June	Strawberries	50 "
	Fish	26 Lbs.
	Beet Greens	10 Pts.
	Chickens (12 broilers)	16 Lbs.
	Rhubarb	10 Pts.
June–July	Peas	50 "
	Cherries	10 "
June–Oct.	Spinach, Other greens	30 "
July	Gooseberries	10 "
	Raspberries, Other berries	50 "
	Fruit Pies, baked	12 Pies
	Chickens (24 fryers)	48 Lbs.
	Beef (1 quarter)	100 "
July–Aug.	Green Beans	30 Pts.
	Carrots	20 "
	Blueberries	10 "
July–Sept.	Assorted Fruit Purées	50 "
	Apricots	10 "
	Cauliflower	15 "
	Beets	10 "
	Broccoli	15 "
	Brussels Sprouts	5 "
	Soy Beans	5 "
Aug.	Fish	26 Lbs.
	Ice Cream	3 Gal.

Aug–Sept.	Sweet Corn	65 Pts.
	Lima, or Shell Beans	20 "
	Squash	10 "
	Pumpkin (or pie mix)	20 "
Sept.	Lamb (1 carcass)	50 Lbs.
Oct.	Chickens (6 roasters)	24 "
	Fish	26 "
	Parsnips, Turnips, or Rutabagas	10 Pts.
Nov.	Pork (1 hog)	100 Lbs.†
	Ice Cream	3 Gal.
Dec.	Fish	26 Lbs.

* A meat carcass dresses out to about 50% of its original weight by the time it is trimmed, boned, etc., and ready for the freezer.

† A portion of this meat would be cured for use as hams, bacons, etc.

Explanation: Any of the fruits or vegetables may be substituted for those more readily available from your garden or your locality; the supply is to provide all the fruit and vegetable needs (except root storage vegetables such as potatoes and fruits such as apples) during the non-productive months of the year. The meat budget supplies poultry and fish as well as meat and should be drawn on continuously; it will provide a wide variety of these foods at all times. Besides space being regularly allotted for the storage of ice creams, occasional space may be available as the freezer empties for storing additional "specials" for short periods of time.

Chapter V

THE HIDDEN MERIT OF FROZEN FOODS: BETTER NUTRITION

How long has it been since you have had to take a spring tonic? If you are over thirty you will probably have to count off the years on both hands, for spring tonics went out of vogue about twenty years ago, or more.

When a spring tonic was taken as a matter of course each March or April, it was not just a fanciful idea on the part of mother; it was actually needed to replenish in our bodies some of those nutrients which were not available in the winter diet, the minerals and vitamins which were lacking when no fresh foods were eaten other than meats and cellar-stored vegetables. Winter diets were vastly improved when this country's network of fresh produce markets was established and perishable foods began to be properly refrigerated in transit. Now that frozen foods are being made so readily available it will be possible to have an almost perfect year-round diet. And, it will be good eating, pleasant eating—not the hold-your-nose-while-you-gulp-it-down variety which the taking of tonics represents.

Now, when a person can eat what he *likes* and profit from a hidden merit—better nutrition—it is a very happy circumstance indeed!

One of the most valuable things about frozen foods is that *they are the equivalent of the fresh food, nutritionally speaking.* One can make an even stronger statement in their behalf: sometimes they rate *higher* in nutritive value

than fresh foods which are purchased at market! Furthermore, no such food value comparisons can be made with any other method of food preservation.

Don't misunderstand, a balanced diet will still be of paramount necessity for good health; a balanced diet cannot be disregarded merely because frozen foods are included wholly, or in part, in the daily food supply. Milk, butter, eggs, cereals, and the like will still have to be considered by the wise homemaker who wishes to feed her family the best possible diet. But the year-round use of frozen foods whenever fresh foods are not available will insure to a far greater degree an adequate supply of those nutrients necessary for the best of health.

The lack of fresh foods (or their nutritional equivalent) during a large portion of the year has been a cause of sickness and ill health throughout the centuries. Napoleon encountered many of the malnutrition diseases among his fighting army which cut the strength of it so seriously that it undoubtedly can be considered a factor contributing to his defeat. France, in the wake of wars and revolution at about this same time, was so acutely pressed for proper food supplies that the French Directory (governing board) desperately offered a prize of 12,000 francs to any person who could develop a new and better means of preserving food. Nicholas Appert won the prize by his invention of canning and added to the already known food preservation methods of drying (dehydrating), pickling, and fermenting.

An emergency food crisis such as Napoleon and France underwent, such as the nation and the world has just experienced, always brings about a new appreciation of the true meaning of the value of food as human nutrition. Food at such times no longer is just something to eat, but something to sustain physical fitness. To-day homemak-

ers know more about foods and nutrition than they did ten years ago; likewise they care more about whether the foods they serve their family will sustain physical fitness. In light of the present general knowledge of and interest in nutrition, and the swiftly expanding acceptance and use of frozen foods, there is every reason to believe that the malnutrition ailments such as beri-beri, scurvy, anemia, and pellegra will practically be eliminated before too many years have passed. In not all, but certainly in a great many cases, many forms of sickness can be traced to either wrong eating habits or inaccessibility of sufficient fresh foods. If you doubt this statement think back to your last encounter with the family physician. Was what you eat discussed? Was a diet prescribed or recommended as part of the proper treatment for recovery?

On the surface, the needs which go to make up adequate human nutrition—proteins, carbohydrates, fats, minerals such as iron, calcium, phosphorus, and the group of vitamins—seem to create a hodge-podge. Actually, human food requirements dissolve into a simple pattern. Remember that most nutrients abound plentifully in foods when they are properly taken care of prior to consumption and anyone eating a wide variety of foods is apt to have a fairly substantial supply of all human nutrition needs which meet all normal health requirements. The time to worry about what you are eating and the nutritional value of your food is when the diet goes "off balance" and appetites are satisfied by too much of one kind of food at the expense of variety.

About as simple design for living as can be found is the well-known repeat phrase: We eat to work to earn money to live to eat to work to earn money to live, ad infinitum. Simple as this is, it is nevertheless a very basic pattern of to-day's life cycle. Try eliminating any one phase of it—

the eating, the working, the money to buy things—and the whole structure of living topples. The cycle breaks and cannot be reformed until the missing part is reconstructed.

So it is with food, nutrition, and health. Nutrition follows the same simple, basic cycle. In fact this repeat phrase can serve to illustrate the nutrition cycle:

We eat foods (nutrients), some of which go to work in our bodies (fats, carbohydrates, and some proteins, for energy) to provide the wherewithal, or body structure (proteins for body tissue; minerals for blood and bone), to live (vitamins provide the pleasures of life: happy frame of mind, good eyesight, stable nervous system, smooth complexion, good digestion, etc.). Like the living cycle, if any one of the phases of the nutrition cycle is omitted the results are malnutrition (ill health, and in serious cases the malnutrition diseases). These can only be cured by supplying the missing nutrients.

Let us digress further for a moment and briefly consider some of the things nutritionists have discovered about food properties, their functions in the body.

The nutritional properties of a food, its nutrients, are determined by chemical analysis—in the case of vitamin determination using experimental animals, it is called "assay." In the laboratory through such tests it is the prime objective of the nutritionist to find out: (1) which nutrients are contained in which foods; (2) how these nutrients are utilized by the body; (3) to what extent these nutrients are needed by the body; (4) how much of the nutritive value of a food remains in the food after it has been stored, preserved, or cooked and is eaten.

The essential constituents of food include proteins, fats, carbohydrates, minerals, and vitamins. Of these, most persons are more familiar with proteins, fats, and carbohydrates and the heat units (calories) they furnish

the body. This familiarity isn't necessarily due to popularity because women, especially those who wish to keep trim, are afraid of calories. A too high caloric diet contributing to obesity certainly is neither to be desired nor good for the individual; yet the diet that is practically devoid of caloric value contributes to a listlessness and a continued tired feeling. Energy to perform each day's tasks must come from some place and the only source of physical energy comes from fats, carbohydrates, and, within certain limitations, proteins.

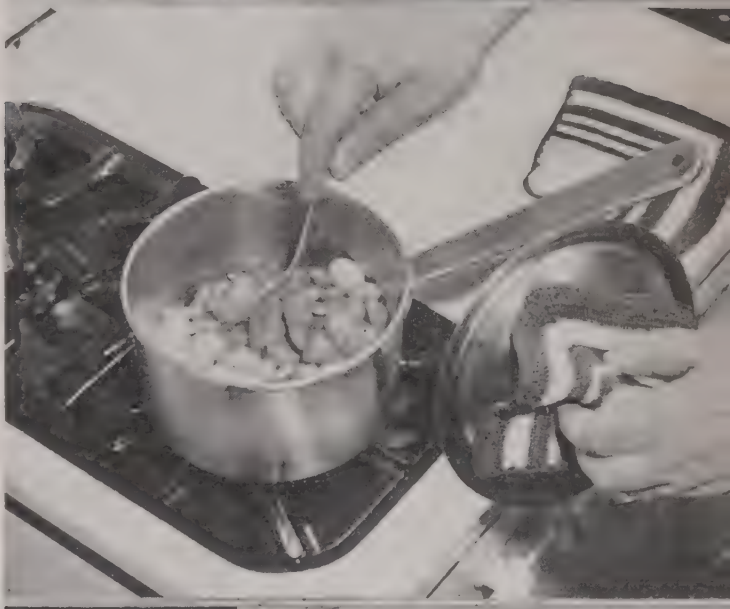
A small amount of fat is necessary for the good absorption of certain essential foods from the digestive tract into the blood stream. Carotene, the precursor of vitamin A, makes a good example for this need. The utilization of this vitamin by the body is greatly dependent upon the small amounts of fats consumed with the diet; without fats, one could consume considerable amounts of carotene (vitamin A) without much benefit and eventually might have a vitamin deficiency.

It is impossible to live long without an adequate amount of protein in the diet, even though one may exist for considerable periods of time with little carbohydrates and fats. Proteins are essential, they provide the material necessary for repairing the wear and tear of soft tissues and for building new tissues. That's why, during the recent war, meat was such a vital food and was given in great quantities to the armed forces.

Proteins are converted during digestion into simpler substances called polypeptids and amino acids which can pass through the wall of the intestines and be taken into the blood stream. These substances circulate in the blood and are at the beck and call of the body cells . . . the cells select the particular amino acid needed for their particular job of building or repair. At least ten of the

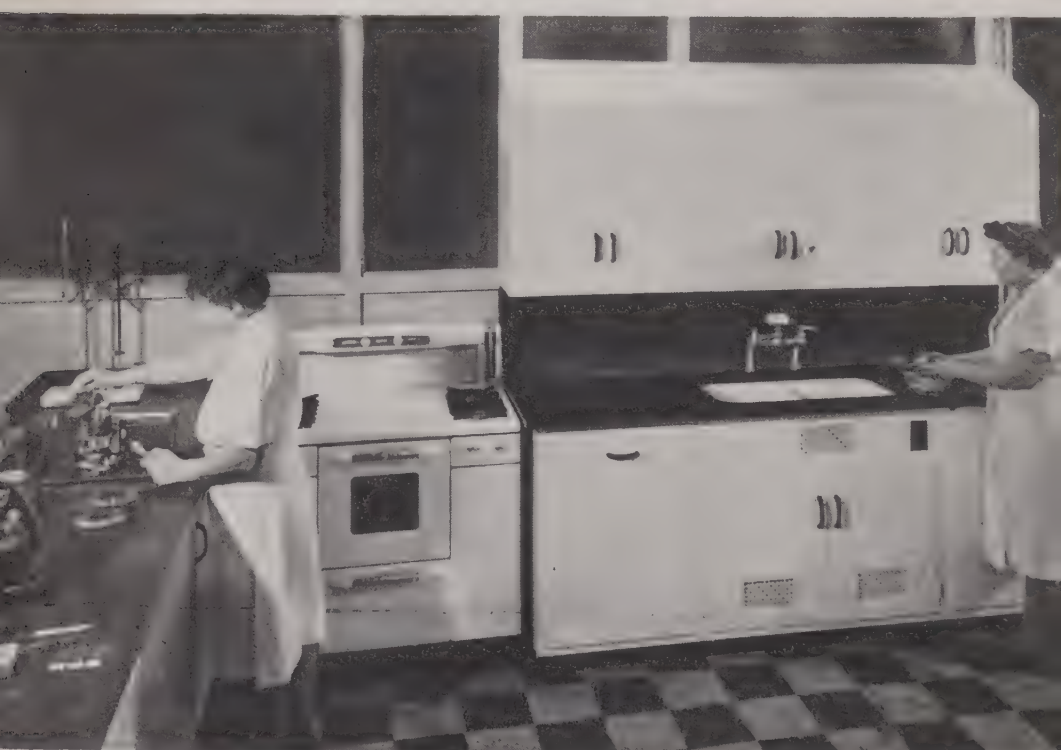
The recommended procedure which will conserve the maximum amount of nutrients when cooking frozen vegetables is here illustrated. With heat turned to high, drop solidly frozen blocks of vegetables into small amount (1/4 to 1/2 cup) of rapidly boiling water. Then place cover on utensil.

When steaming briskly, break apart frozen vegetables with fork. Replace cover. When steaming again, turn heat to low for gentle cooking the remainder of the cooking period. Because of blanching before freezing, a much shorter cooking period is required than for fresh vegetables.



As soon as vegetables are cooked tender, serve immediately, dishing up the small amount of remaining liquid with the vegetables. Try to plan cooking of vegetables so there will not be a waiting period between range and table, or nutrients will be lost during such a waiting period.

Research has proved low temperatures preserve nutrients, so keep foods at refrigerator temperatures u
such time as they are used. Hold vegetables in refrigerator after harvest until they can be frozen.



Many food research laboratories, such as that of the Frozen Food Foundation, Syracuse, New York, consta
study the effects of freezing, storage and cooking on the texture and nutritive value of foods.

amino acids have been found to be nutritionally essential, and, since food proteins differ in the kinds and amounts of the different amino acids, it is recommended that the diet provide several sources of protein so all the essential amino acids are consumed in ample proportions. This gives substance to the statement made earlier in this chapter: "anyone eating a wide variety of foods is apt to have a fairly substantial supply of all normal human nutrition needs . . . the time to worry is when the diet goes off balance." Let us presume, for example, that meat is absent from the diet but that sufficient vegetables high in protein content (green lima beans, Brussels sprouts, corn, kale, peas) are consumed, supplemented by occasional protein from fish and fowl. It is likely that such a diet would be off balance because it lacks a wide variety of protein foods. Besides meat, vegetables, fish, and fowl, excellent sources of protein can be found in milk, cheese, and eggs. Several different kinds of these protein foods should be consumed daily.

There is another reason why it is desirable to eat a wide variety of foods: they contain a great many minerals, scientifically called inorganic ions, which are absolutely essential to life. Nutritionists know these essentials to be sodium, potassium, calcium, magnesium, iron, copper, manganese, sulfur, phosphorus, chlorine, iodine; probably there are many others which are required in very small amounts. Those most often lacking in human diets are calcium, phosphorus, iron, and iodine. Consequently, it is rather common to hear of simple goiter caused by a deficiency of iodine which causes enlargement of the thyroid gland, or anemia brought about by a deficiency of iron in the diet.

For adequate amounts of calcium, phosphorus, iron, and iodine look to the following foods: cheese, milk, ice cream

(rich in calcium and phosphorus; contain some iron); meats, marine fish and shellfish for iodine, iron, and other minerals, and fowl (phosphorus and iron); most vegetables are good sources of calcium, phosphorus, and iron. Few fruits give any substantial amounts of these minerals, although apricots are an excellent source of iron while blackberries and loganberries are fair sources.

The importance of vitamins need not be stressed but there are some existing fallacies which might well be cleared at this time. One is that vitamins in large doses present a cure-all for most of the aches and pains of humanity. True, where there is a lack of a vitamin, a replenishment in the body will effect a cure of the ailment caused by the deficiency, but vitamins *alone* will not effect a cure-all. By taking large quantities of them or eating them in foods, vitamins will not keep you healthy *unless they are accompanied by a balanced diet*—a wide variety of many foods. The vitamin-conscious public has gone so far in their thinking in this direction that many persons disregard what they eat so long as they feel their vitamin intake is sufficient to give a wide margin of safety in matters concerning health. As a matter of fact, it still remains to be proved by nutrition science just what may happen to *impair* health when vitamins are consumed in great excess of their need!

It is also generally believed that in order to get adequate vitamin content in natural foods which are eaten one must necessarily consume quantities of special foods such as spinach or citrus fruit. This is not true for vitamins abound plentifully in many foods; and, once again a good rule of thumb to follow, is to eat a wide variety of foods. There is no intention here to belittle the fine qualities of citrus fruits nor the excellent marketing facilities the citrus growers have developed, for one of the rea

joys of greeting each day comes by way of tipping the elbow with a glass of freshly reamed orange juice or confronting a segmented grapefruit brimming with tangy juice—but—there are *nine* common vegetables and *three* fruits which grow in the Temperate Zone which outrank the citrus family in vitamin C: beet greens, broccoli, Brussels sprouts, cauliflower, collards, peppers, kale, kohlrabi, and spinach; currants, gooseberries, and strawberries.

Some fruits have a high content of carotene (vitamin A) as well as vitamin C; vegetables have vitamins A, B_1, and C, and also fairly good portions of the other vitamins with the exception of vitamin D. Halibut, cod, and other fish livers, and fish oils as well as butter and cheese are rich sources of vitamin A. Pork is one of the best sources for substantial quantities of vitamin B_1 (now called thiamin); yeast, kidney, and liver, and the germ of grains are also potent sources of thiamin. Beef liver and eggs are excellent sources of vitamin A; while beef liver is also one of the best sources of riboflavin. Kidney, heart, eggs, cheese, dried milk, vegetable greens, and cereal germs are also excellent sources of riboflavin.

Vitamins are important for each has one or more specific functions in human nutrition. Vitamin A protects specifically against the eye disease known as xerophthalmia, forming a part of the pigment of the retina. Unless sufficient vitamin A is provided for the formation of this pigment, the eyes gradually lose their ability to see normally in dim illumination—a condition known as night blindness, and, incidentally, often encountered among the armed forces of the recent war. Severe and prolonged deficiency of vitamin A leads eventually to total blindness. Vitamin A also helps maintain normal development of the teeth as well as a special kind of tissue which acts as a protecting layer of body surfaces.

Vitamin B_1 (thiamin) protects specifically against beriberi in humans. Its absence causes an incomplete oxidation of sugar in the body which results in an accumulation of toxic products. This deficiency shows itself in a marked loss of appetite, loss in weight, impaired functioning of the nervous system, occurrence of pains and weakness in the limbs, and a slowing of the heart rate.

Vitamin C helps produce the inter-cellular structure of the body. Its deficiency causes the nutrition and structure of the teeth to suffer; and as the deficiency becomes severe, the tiny capillary blood vessels become weakened and cause hemorrhages throughout the body, bleeding of the gums takes place, the teeth loosen, the joints become swollen and the bones become porous and fragile. These are the symptoms of scurvy.

Vitamin D, commonly called the sunshine vitamin, is necessary for the normal growing of bones. It is a highly important vitamin for children and adolescents, and those recuperating from bone fractures, etc.; but to what extent it is necessary for adult nutrition has not yet been determined, although adequate amounts may be important for the prevention or arrest of tooth decay. Fish and fish liver oils are excellent sources of vitamin D; eggs and butter furnish considerable amounts; and some is obtained through exposure of the skin to the rays of the sun.

Vitamin E, the antisterility vitamin, has been found valuable for late stages of growth and for reproduction. Since it is present in so many foods and so resistant to destruction, ordinary diets are seldom deficient enough to cause any trouble.

Vitamin G (riboflavin) plays an important part in the oxidative processes of all living cells. Cessation of growth, marked loss of hair, nutritional cataract, and dermatitis are some of the physical effects when this vitamin is deficient.

Vitamin K is a newly discovered vitamin and is necessary to the maintenance of normal blood clotting time. It is found in considerable quantities in green leafy vegetables.

Niacin, one of the B complex group, is the pellagra-preventive vitamin. It has recently been recognized as nutritionally important and believed to form a substance in the body which promotes oxidation. Lean meats, chicken, liver, vegetable greens, legumes, and tomato juice are good sources of this vitamin.

Besides niacin, thiamin, and riboflavin, the best-known members of the B complex group include biotin, pantothenic acid, and pyridoxin. There are also six or eight less-known factors recognized as important for some forms of life. A deficiency of biotin may cause dermatitis, nervous ailments, and loss of appetite; pantothenic acid is essential for growth; pyridoxin is needed for the utilization of unsaturated fatty acids.

The vitamin family seems to be a never-ending source of interest to the nutrition worker because of the many characteristics which identify each, and the strange peculiarities which identify some. Dr. Jennie McIntosh, a nutritionist who has devoted much of her work to the freezing of foods, presented these vitamin characteristics and idiosyncracies in a most interesting manner once when she was called upon to speak at a food conference. She said:

"We might compare them with people .... When I first came into this room to-day there were very few familiar faces. As I now glance over this group, I notice the few faces that I know, a note of color in the gay hats and dresses women are wearing, and of course many new faces. Now if this conference should last several days and we talked together, ate together, and more of you appeared in the role of guest speakers, I would soon come to know some of the personality traits which distinguish each of you from every other person in the room.

So it is with the nutrients inside a carrot, for instance. At first we know it by its color, its flavor, its texture. Then we begin to separate those various life-giving elements of which it is composed. We get to know their personalities and discover the techniques to use in order to isolate and identify them. For instance, Mrs. B. wears brown—it's her favorite color; she likes silver jewelry; she reacts violently at the mention of Democrats; she may generally be found in a small but tastefully appointed office overlooking Park Avenue, but she can be attracted away from that office by good company, or a good movie or play; and so on.

"Now let us personalize the characteristics of vitamin C. Vitamin C is usually present in fruits, vegetables, and some meats. The amount present depends upon a number of factors such as kind, variety, maturity, etc. Vitamin C dissolves rapidly in water so if there is a lot of water about, vitamin C will come out of our food and into the surrounding water (such as cooking water). Vitamin C can also be destroyed by heat and by air so we must keep this personality cool and keep the air out of the cells where it dwells.

"Each vitamin has its personality. While vitamin C is attracted to water, vitamin A is attracted by fats; furthermore, heat doesn't affect it much and we can depend upon it staying in most foods until we eat them. Because of these characteristics, vitamin A is more hardy than most of the other vitamins, and we don't have to worry much about vitamin A deficiency if we eat our carrots and other yellow vegetables, spinach, butter, etc.

"There is also the shy little vitamin riboflavin. . . . She is destroyed by light. Therefore, in order to keep her happy we must keep her in the dark. That is quite easy because the cell walls and the tissues of food protect her from the light. But when she is not protected, such as when milk stands on the doorstep in the bright sun for a long time, she just wilts away and is no longer of any use to our bodies.

"Now vitamins have friends and enemies too. Since most vitamins like to live in a slightly acid community, when there is some acid present as in most fruits and tomatoes, the vitamins live much more happily. Another friend within their midst is buffers. These substances are like campaign managers keeping the conditions in the foods just right so the vitamins may live happily. In order to keep as many vitamins in our foods as possible, we try to help their friends and destroy their enemies. The most important of their enemies are enzymes (organic substances in food). For nearly every vitamin,

there is an enzyme waiting to hurt the vitamin if it can get a chance. Usually the vitamins don't get killed but just beaten up and changed into a form which our bodies can't use. Now most enzymes do not like heat, in fact after they have been thoroughly heated they can no longer carry out their best intentions to destroy the vitamins. That is why we blanch vegetables before freezing them in order to destroy these enemies and protect the vitamins."

Nutritionists have discovered, then, that temperature, air, extreme heat, and even light in some instances, affect the lives of vitamins. You will notice in succeeding chapters how these factors are taken into consideration in the proper handling of foods for freezing and the subsequent preparation for table use so that the greatest possible amount of nutrients will be retained in foods when they are consumed.

In saying that frozen foods are the equivalent, nutritionally, of fresh foods, it means that only small amounts of the nutrients are lost in the process of preservation and that *no more* are lost than in the ordinary procedure of preparing fresh foods for consumption. So if care is taken in procuring the fresh vegetables for freezing directly from the garden there is every reason to believe that they rate as high in nutritive value when frozen, stored, and served at the table as fresh cooked vegetables. At refrigerator temperature (38° to 50° F.), while the nutritive loss is not great, there nevertheless is a loss of some of the nutrients. Most often several days elapse between harvest of market vegetables and the time they reach the green grocers; add to this the time elapsing until you buy them, then serve them, and it is easy to understand why this statement is true.

Let us clear up another broad statement made at the beginning of this chapter which stated that no such food value comparisons can be made with any other method of food preservation.

It is an established fact that the temperature at which foods are kept is an important factor in controlling the rate of loss of certain vitamins. For example, in hot summer weather some vegetables at room temperature standing over a 24-hour period will lose as much as one-half their vitamin C content. At refrigerator temperature the loss is a fraction of this amount; at 0° F. temperature the loss is practically negligible. These statements particularly apply to leafy vegetables and snap beans. Root crops, such as beets, carrots, parsnips, rutabagas, and potatoes, also lose vitamin C even at cool storage but the rate of loss is relatively slow. In canning and dehydration, foods are heated for long periods; in fermenting and brining, foods are exposed to room temperatures, at best the cold of an unheated room during winter.

All the food properties of fresh and frozen foods have been given keen observation by scientists, but most of their studies have been concerned principally with possible losses of vitamins because of all the nutrients these are the most easily lost.

The studies carried out on proteins indicate that there is no loss of proteins during freezing and cold storage so that the protein in frozen foods is the same as that of fresh.

The only important change which occurs in fat that has been noted is the development of rancidity if fatty foods are stored at too high a temperature for too long a time. The fats of fish become rancid more quickly than those of meat, although pork fat turns rancid rather quickly if the frozen product is kept in storage at a temperature much above 0° F. As fats turn rancid, they oxidize and hydrolyze simultaneously. Oxidized fats do not possess the nutritive value of sweet fats; and the oxidation of the fat causes the gradual destruction of its vitamin A content. Since it has been clearly shown through studies that the

development of rancidity in fats can be retarded, in some cases almost indefinitely, by low temperatures, it seems evident that under proper storage temperatures this change in fats and subsequent loss of food value is not significant.

In the storage of carbohydrates at low temperatures, there is a gradual change in the sucrose of fruits to dextrose and levulose, but since this is a change which occurs during the digestion of the fresh fruit it makes the sugars of frozen fruits more easily digestible.

A comparatively small amount of work has been done to prove that cooked frozen foods are as high in minerals as cooked fresh foods. Most of the loss of minerals occurs when frozen foods are thawed; there is "drip," and some of the natural juices leak out of the food. In the case of fish, where there is likely to be the greatest leakage, fast freezing and slow thawing minimize this loss. Very little leakage occurs during thawing of meats and poultry so mineral loss is negligible. The drip which may occur in fruits is contained in the syrup which is usually eaten along with the fruit so there is no real loss of minerals in this frozen product. In frozen vegetables the loss depends upon the way they are cooked; if the solidly frozen vegetables are dropped into a small amount of cooking water and the cooking water is consumed along with the vegetables, there is no loss of minerals; but if the cooking water is discarded the loss may be slightly greater from frozen than from fresh vegetables.

There is conclusive evidence that frozen vegetables when served are as rich in vitamin C as fresh cooked vegetables. Since vitamin C is the most easily lost in preparation and preservation of foods, if a food has the normal vitamin C content, it is highly probable that the normal amounts of the other vitamins are also present.

Since vitamin C is easily oxidized near the boiling point, and this vitamin is also water soluble (leached out into water coming into contact with the vegetables), most of the vitamin C loss occurs during the blanching and cooling of vegetables during preparation for freezing. But there is less loss of this vitamin during the short cooking period of the frozen vegetable than there is during the longer cooking of the fresh vegetable, so the loss is counterbalanced.

The temperature under which the frozen vegetables are held in storage also affects the rate of loss of vitamins. It has been found that at 0° F. the loss was so very slight it was negligible.

Similarly, since no heating of the product occurs in the preparation of fruits for freezing, storage temperature is the factor governing vitamin C loss in fruits. Studies prove there is little loss of this vitamin in long-continued storage at 0° F.; however, should the storage temperature be maintained at 10° to 15° F. the rate of loss becomes rapid.

Summarizing the work done on the retention of carotene (vitamin A) in vegetables during preparation for freezing, freezing, and storage, studies indicate there is little loss of carotene during the preparation and freezing of most vegetables. However, there is some danger of loss of this vitamin during long-continued storage.

Vitamin B_1, or thiamin, is affected by heat and dissolved by water, so there is a loss of this vitamin in vegetables during blanching in preparation for freezing, but no actual loss was found during freezing itself and subsequent storage. Here again, this loss is counterbalanced by the loss during the longer cooking period of the fresh vegetable.

Studies on frozen peas, lima beans, asparagus, spinach, and broccoli in relation to freezing and loss of vitamin G

(riboflavin) are variable and not complete enough for final conclusions. In some studies, riboflavin content of some frozen vegetables was more than the fresh equivalent; in some cases as much; at times, a loss has been indicated.

At present many very valuable nutrition studies are in progress concerned with determining more facts about freezing of foods, studies that will undoubtedly reveal more undiscovered truths about the merits of frozen foods, even though the scales already tip far in their favor.

Frozen foods can—and probably will—have a marked influence on the collective health of our own country and that of the entire world. Freezing preservation is the greatest single food discovery in the history of food and man. Frozen foods make available for the first time the highest possible standard of food diet at all times, under all conditions of living, climate, and economics. What's more, frozen foods are not only good for you—to paraphrase an overworked statement—but they're GOOD! Their appeal is universal because they taste and look so very much like freshly harvested foods; the appetite loses none of its sharpness when viewing the brilliant colors of frozen foods, colors as though nature had dug deep in the earth to endow them with something precious: ruby strawberries, sapphire blueberries, garnet raspberries, topaz peaches, emerald peas, gold carrots, bloodstone beets, moonstone cauliflower.

Such goodness means ready acceptance!

Chapter VI

"BIG FIVE" FOR FRUITS AND VEGETABLES

The freezing of foods is like sewing a dress. Anyone can follow the pattern in cutting the fabric and putting the pieces together, but the results show up in the little tailoring tricks you know which make all the difference between a "fashion" and a "home-made." Just so with freezing foods. Anyone can follow the directions for preparing foods for freezing, but it takes the little bit of extra "know-how" to make the food "company fare."

If the strawberry shortcake you make with your frozen strawberries in December tastes and looks just like the strawberry shortcake you make in June, then your frozen strawberries are sheer perfection . . . if the lima beans or peas you freeze in the summer bring to mind visions of tender green pods on the vine when cooked and eaten in January, then they are of the best possible quality.

This chapter is devoted to helping you freeze foods like that. Here is the extra know-how which will keep the garden-fresh colors and flavors in the frozen foods.

Not just *any* fruit or vegetable can be put into the freezer and emerge after months of storage tasting and looking so good you can't "tell the difference." Some vegetables are liable to be tough textured; others, pale and without much flavor. Fruits are apt to darken and turn slightly bitter in taste.

Neither can one determine easily just what is the cause of any specific failure—when you have any, for there are five big factors which control quality. And, vice versa,

these same factors also provide the reasons for any freezing failures you may encounter. The big five for quality are: variety selected for freezing fruits and vegetables; maturity at which the product is harvested; speed from harvest to freezer; the proper packaging; and storage temperature at which the product is held until such time as it is eaten.

Food freezing knowledge, then, starts with the garden.

Your Guide to Variety

Have you ever visited your own state agricultural experiment station? It is an exceedingly interesting place, one that is continuously working for your benefit in things pertaining to agriculture. It is at the state agricultural experiment stations and the Bureau of Plant Industry, U. S. Department of Agriculture, where most of the work has been done in developing and determining the right kind of varieties of fruits and vegetables which will give the finest frozen product. These agencies, working in conjunction with seed houses, will be busy for years to come developing new strains of established varieties and also new varieties especially suited to freezing, for it may take as many as twenty to twenty-five years to get results in some cases. For instance, twenty-five years of development work at the New York State Experiment Station, Geneva, New York, went into producing the Cortland apple, a variety which doesn't brown readily.

You will find your own state experiment station an excellent supplementary source of information for those varieties which are especially adapted to the climatic and soil conditions of your locality. Not all varieties of all fruits and vegetables, especially fruits, will grow as well in all localities.

Color is the key to preferred varieties for freezing and

can also be used as a guide for selection when produce is not home grown, but purchased at market when the specific variety may not be known. Color not only helps the appearance of a fruit or vegetable, but it usually is an indication of more intense flavor, and, in some cases, a direct index of the vitamin content of a vegetable. So those varieties of vegetables having intense color are almost always better for freezing than varieties lacking in color. You see, in blanching vegetables a portion of the flavor is washed out of the vegetable, so it is desirable to have enough flavor in the vegetables before you start to freeze them. Otherwise the frozen product will be anemic-looking and weak in flavor as well. Carrots, beets, corn, peaches, raspberries, strawberries—many of the fruits and vegetables can serve to illustrate this point. Carrots of the so-called "coreless" varieties produce a finer frozen product than those with pale centers; beets such as a Crosby Egyptian strain may have light streaks running through them, while a variety such as Detroit Dark Red is uniformly red throughout and therefore much preferred for freezing; the yellow sweet corn varieties are much superior for freezing than white varieties.

The variety of fruit used for freezing is almost more important than the variety of vegetable selected because it affects the frozen product even more. The fruit variety selected can mean either success or failure since some varieties are so greatly changed by freezing they barely make an edible frozen product. Peaches provide a good example to illustrate this point. The common white peach variety, Champion, turns very dark during freezing and thawing and there is relatively little flavor in the frozen product. On the other hand, many yellow varieties, the J. H. Hale in particular, retain both color and flavor very well. The Sunbeam variety of yellow peach never dis-

colors, but since it is not a good bearer this variety is not very popular. In those areas where the Cuthbert raspberry grows it is superior for freezing because it is of deep color and fine flavor.

Besides deep color in fruit, those varieties which produce a firm fruit when ripe and which do not darken quickly when cut or peeled are best for freezing.

Where fruits are home grown, variety presents more of a problem than it does with vegetables, since one cannot change fruit trees from year to year as one can vegetables. But there are two things you can do to get the right kind of varieties growing in your orchard: (1) enlarge your standing orchard to include a few trees of the right varieties; or (2) replace non-productive trees and berry bushes with a good variety for freezing. Either of these measures would take several years before a crop could be harvested, but if you have access to freezing facilities in a locker plant or have a home freezer or are making plans to have one in the near future, these steps would doubtless be worth consideration now.

At the end of this chapter will be found a *Planting and Harvesting Guide* which gives lists of preferred varieties of fruits and vegetables for freezing together with additional information about stage of maturity desired for harvesting and comments concerning the freezing of each vegetable.

Watch Maturity

A popular misconception about frozen foods is that freezing performs a miracle, it improves upon nature. Freezing is the best method of food preservation but it will not transform not-so-good food into the essence of perfection, although under the proper conditions of packaging and storage it will retain most of the good color,

flavor, and texture that is there to start with. So the condition of the fruits and vegetables you freeze will directly affect the quality of the frozen product. Old, starchy peas will taste old and starchy when frozen; tough asparagus will be tough when thawed and cooked; unripe peaches turn sour and bitter when frozen and browning and discoloration are more pronounced; soft, mushy strawberries will be more mushy and shapeless often with an undesirable off-flavor. But fruits and vegetables at the peak of their perfection—when they are best for eating—will be as perfect as freezing can keep them if the proper care is taken in preserving them.

This stage of maturity is called optimum maturity. It is when peas are sweetest, corn kernels are filled with milk that is sweet and not starchy, and snap beans have lots of "snap." When vegetables are purchased at market and you have no control over their stage of maturity, it is better to select vegetables which are slightly immature rather than those which are likely to be tough or starchy.

The best description of the stage of maturity desired for fruits is a "soft-ripe but not mushy" condition, so that when they are thawed and used for dessert purposes they will have fine flavor, color, and texture. A much finer frozen product will also result if tree- and vine-ripened fruit is used wherever possible. Fruit picked green and left to stand until ripe will not give the same high-quality results, with the exception of pears which are better if picked green and allowed to ripen in storage.

Since some fruits may not mature uniformly, by picking over the trees a number of times one can get properly tree-ripened fruit which will give the best frozen product. If all are picked at one time regardless of whether or not all the fruit is ripe, it will necessitate sorting out the unripe fruit and letting it stand to ripen before freezing it.

Varietal characteristics of a vegetable are important in obtaining frozen products of excellent quality. Color, flavor and texture of some varieties are much more desirable for freezing than others. (See Planting and Harvesting Guide, pages 85–98.)

Photo above (*courtesy Ferry-Morse Seed Co.*) shows row of Thomas Laxton peas which have excellent characteristics for freezing. Insert photo at top shows close-up of well developed pod filled with sweet, tender peas at best stage of maturity for freezing.

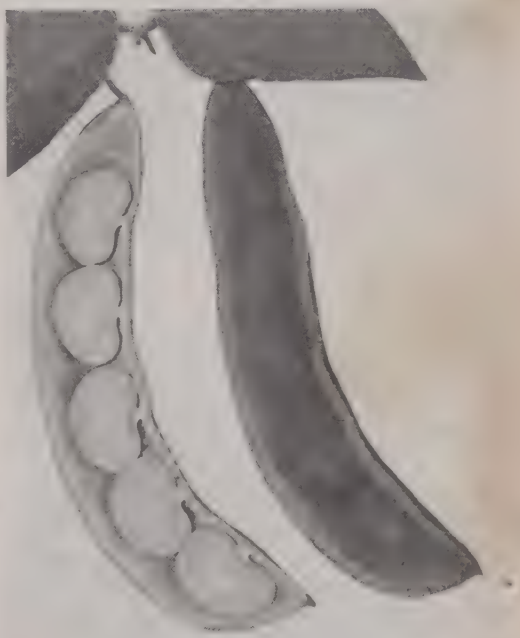


Photo at right (*courtesy W. Atlee Burpee Co.*) shows pod characteristics of Burpee's Improved Bush lima beans, an excellent variety for freezing. Some varieties of lima beans grown for commercial purposes are almost impossible to shell by hand at home, so easy shelling of limas is an additional factor to be given consideration for home freezing.

(Right) Tampala, a new spinach-like vegetable. *Photo, W. Atlee Burpee Co.* (Below) July Morn, new variety of strawberry especially desirable for freezing. *Photo, J. H. Clark, New Jersey Agr. Exp. Sta.*

(Below) Browning is marked in some peach varieties. Compare thawed samples two and four. *Photo courtesy U. S. Bureau of Plant Industry.*

This, as mentioned above, produces an inferior product.

In cases where fruit is too ripe for high-quality results, fruit juices or pulp (purée) may be successfully made and frozen if the soft, over-ripe fruit has not deteriorated in flavor. Instructions for freezing juices and purées are given on pages 140 to 145.

Speed Produce from Harvest to Freezer

"Let no time be wasted or your produce may be" is a good adage to heed if you are out to freeze the best fruits and vegetables you possibly can. The lapse of time between garden and freezer can be one of the most ruinous things that can happen to good fruits and vegetables. So once produce is harvested, let no more time elapse than is absolutely necessary before you freeze it. The goodness in vegetables particularly (as has been pointed out in the previous chapter) can waste away rapidly. At normal summer room temperature, asparagus is materially affected within several hours losing flavor, sweetness, and becoming woody in texture; sweet corn rapidly loses its sugar content if any delay is encountered before freezing; if greens are allowed to wilt, most of their goodness has vanished. If vegetables and fruits cannot be frozen immediately after harvest, be certain they are refrigerated, then plan to freeze within 24 to 36 hours.

What Makes a Good Package?

Those attempting to freeze foods for the first time are apt to be hesitant about expenditures for the proper packaging materials for their foods and resort to the use of makeshifts which might happen to be at hand, such as ordinary ice cream containers or butcher's paper which may cost little or nothing. But experience has proved

beyond the shadow of a doubt that the few dollars and cents one may spend for the best packaging materials available are well worth the money considering that spoilage from improper packaging is likely to occur and represent more of a loss in the long run.

You see, foods cannot be put into the freezer without adequate protection from other foods which may give off-flavors, nor adequate protection against the low humidity (dryness) of a locker or home freezer. Because of the dry atmosphere, there would be so great a loss of moisture over a period of time that the quality of the food would be poor. Simultaneously with moisture loss also color, flavor, and texture deteriorate. To protect foods in a freezer, materials must be specially made for packaging so they will be *proof* against moisture losses and vapor losses (exchange of flavors). Hence the term "moisture-vaporproof" commonly used when referring to packaging materials for freezing.

The trial and error method of development of such materials early showed that ordinary waxed paper and butcher's paper were not adequate protection against drying out and deterioration of frozen products; that glass containers have the advantage of transparency but the greater disadvantage of breakage; and neither tin nor glass containers stack (one on top of another) well in a locker or freezer. It was found that treated paperboard (specially waxed), moistureproof vegetable parchment paper, and special moistureproof Cellophane (which can be heat-sealed) made into containers, bags, and sheets for wrapping provide the proper protection needed.

Now that the war is over and once-scarce raw products are again available, you will see vastly improved packaging materials using paper-thin aluminum foil, rubber composition products, and fiberboard-metal combinations.

The Container Corporation of America was one of the first to develop a composite fiberboard-metal carton, rectangular in shape with walls made of paraffin-impregnated fiberboard with an easy-to-handle snap-in metal lid. Pliofilm (made by the Goodyear Rubber Company) is a rubber composition material made into sheetings for wrapping foods, and bags for use inside folding cartons. Rubber composition materials can be recommended highly for their moisture-vaporproof qualities; also, they do not become brittle and tear easily at low temperatures. The Reynolds Metals Company has pioneered in perfecting an aluminum foil with excellent moisture-vaporproof qualities plus an oven-heating value for quickly thawing certain foods such as meats and baked goods right in the oven while the food is in the aluminum foil wrapping.

In order to insure complete protection, some packages must be sealed. Sealing tape has been recommended by some persons but this method of sealing a package is not nearly as efficient as the use of packaging materials which are self-sealing when heat is applied to the over-fold at the top of bag-liners in cartons, or at the overlapping edges of sheeting and waxed paperboard. Such "heat-sealing" can easily be accomplished with the tip of a warm—not hot—electric hand iron, an electric curling iron, or one of the new heat-sealing irons specially made for this purpose and which is sure to find a ready market among the new army of homemakers freezing foods on a large scale.

Besides moisture-vaporproof qualities in packaging materials, it is essential that cartons or containers for liquid or semi-liquid products such as fruits be watertight as well, otherwise the liquid may seep through the package causing a good deal of trouble in the freezer.

Good packaging not only protects the foods but is economical of freezer space as well. For the sake of this

economy we are likely to see a decided preponderance of rectangular and cubical containers in the postwar market. They stack well in a freezer and their use will enable more packages per cubic foot of freezer space. While tub and cup-shaped containers are not as economical of freezer space, they do stack well in a freezer and they also take up little cupboard space for empty storage if they "nest" like the Lily Tulip Cups.

Cartons (the folding type used with moisture-vapor-proof sheeting or bag-liners) and containers (already "set-up" and made with heavily waxed paperboard which is self-sealing) come in several types all of which are satisfactory.

ZERO for Storage

There is some difference of opinion as to the most desirable storage temperature for frozen foods. But actual experiment has proved that the lower the storage temperature, the longer the foods may be stored and the more nearly perfect they will be preserved in color, flavor, and nutrient content. At −40° F. there is no loss of nutrients in frozen foods at all; at −10° F. the loss is barely noticeable; at 0° F. the loss is very slow. But at 10° F. or more above zero, however, the loss is more rapid and within short periods of time definite off-flavors and rancidity are noticeable. At 0° F. most foods can be safely stored for at least one year with no appreciable loss in flavor, color, texture, or nutrient content.

Furthermore, storage temperature should be maintained at a constant low temperature and should not fluctuate widely from 0° F.

Vegetable	Comments about Freezing, or Quality of Frozen Product	Varieties Producing Best Frozen Product: Excellent and Very Good	Varieties Producing Best Frozen Product: Good	Characteristics Indicating Best Time to Harvest
Asparagus	Makes a very good product if handled promptly after harvest; good color, flavor	Martha Washington Mary Washington	Palmetto Keystonian	Stalks well colored; tight, compact, tips. Brittle
Beans, Green Shell	The frozen green shell beans make a better, tastier product than the dried beans, and are a desirable vegetable to freeze when plenty of freezer space is available. Equivalent to lima beans in succotash	French Horticultural Lowe's Champion	Bountiful Giant Stringless Green Pod	Harvest while pods are still flexible, before pods become dry
Beans, Green Snap	The extra trouble it takes to grow pole beans will be well worth it, for Kentucky Wonder produces a frozen green bean superior in color and equal to the fresh in other respects (flat podded beans preferred for French style; round podded preferred for cross-cut beans)	Kentucky Wonder (Pole) Blue Lake (Pole)	Lowe's Champion (Bush) Wisconsin Refugee (Bush) Giant Stringless Green Pod	Harvest before seeds become too prominent. Beans of good maturity should *snap* when broken

PLANTING AND HARVESTING GUIDE (*Continued*)

Vegetable	Comments about Freezing, or Quality of Frozen Product	Varieties Producing Best Frozen Product: Excellent and Very Good	Varieties Producing Best Frozen Product: Good	Characteristics Indicating Best Time to Harvest
Beans, Lima[1]	One of the finest frozen products; freezing seems to emphasize color. Frozen limas taste as good as the fresh cooked	Fordhook (Bush)	Burpee's Bush Clark's (Bush) Challenger (Pole) King of the Garden (Pole) Giant Podded (Pole) Dreer Bush (Bush) Henderson (Bush) Baby Potato (Bush)	The green beans are the tender, tasty ones; harvest when pods are well filled, but still green
Beans, Soy	Produces a very fine frozen vegetable. If you grow soy beans, plan to freeze at least a few packages	Giant Green Willomi Bansei	Hokkaido	Harvest when pods are well filled, but beans are still green
Beans, Wax[2]	Wax beans are somewhat lacking in flavor when frozen, and do not make as desirable a frozen product as the green varieties	.....	.....	.....
Beets	If freezing space is limited, you may wish to can this vegetable	Detroit Dark Red	Crosby Other varieties are satisfactory but may be inferior in color	Young and tender, the fast-growing, first of the season beets make the best frozen product
Beet Greens	These freeze well if selected when tender	Any variety	.....	Harvest when roots are just beginning to form

Broccoli	Since it is difficult to get a satisfactory preserved product by other means, you may wish to freeze this vegetable; it freezes well	Italian Green Sprouting	Other varieties satisfactory	Stalks bearing tight compact heads. Do not allow the bud clusters to flower before cutting
Brussels Sprouts	This vegetable freezes well and will lend variety to the contents of the freezer	.....	Half Dwarf Improved Long Island Improved	Dark green, compact heads should be harvested
Cabbage	Can be frozen and used only as a cooked vegetable, but is deliciously flavored, losing some of its strong flavor during blanching for freezing	.....	Savoy Copenhagen Danish Ballhead Other varieties also satisfactory	Select tight, compact heads still tinged with green
Cantaloupe	See Muskmelon	.....	.....	.....
Carrots[3]	Carrots freeze well, but where freezing space is limited, you may wish to store this vegetable in the cellar	Nantes Coreless Amsterdam Coreless	Red Cored Chantenay	The young, tender smaller carrots are best for freezing
Cauliflower	Freezes well in so far as flavor is concerned, but may develop a slightly off-white color and be inferior to fresh in texture	Forbes White Mountain Perfection Snowball	Erfurt	Solid, well-formed, snow-white heads

[1] Beans, Lima: Burpee's Improved Bush is also a good variety. Henderson Bush and Clark's Bush are good, but are difficult to shell.

[2] Beans, Wax: Round Pod Kidney only variety recommended.

[3] Carrots: All other varieties freeze well, but may be inferior in color.

PLANTING AND HARVESTING GUIDE (*Continued*)

Vegetable	Comments about Freezing, or Quality of Frozen Product	Varieties Producing Best Frozen Product		Characteristics Indicating Best Time to Harvest
		Excellent and Very Good	Good	
Celery	Can be frozen and used only as a cooked vegetable. Not recommended where space is limited	.....	Pascal Salt Lake Other varieties satisfactory	The green varieties have the best flavor
Chinese Cabbage	Gives a very tasty frozen product, but can only be used as a cooked vegetable	.....	Chihli	Heads well formed and solid
Collards	One of the greens that freezes very well	.....	Any variety	Harvest when leaves are small and tender
Corn,[4] Sweet White	White sweet corn does not give the fine flavored frozen vegetable that yellow sweet corn does, but it is satisfactory in other respects for cut corn	.....	.....	Silk of ears will just be dry. Ears well developed, but kernels still are milky when tested with thumbnail
Corn,[5] Sweet Yellow	Freezes exceptionally well if care is taken in the selection and prompt handling. Some may be frozen on cob. Cut corn most desirable	Golden Cross Bantam 8-Row Golden Bantam Kingscrost Golden Bantam	14-Row Golden Bantam Purgold Seneca Golden Maine Bantam Lincoln Indigold Aristogold Bantam	Same as above
Cucumbers	Not suited to freezing	.....	.....	.....

Egg Plant	This product freezes well and is about the only way it can be preserved. A few packages lend variety to freezer contents	.....	Black Beauty New Hampshire Hybrid	Pick when not too large so that seeds are tender and not prominent
Endive	Not particularly well suited to freezing	.....	.....	.....
Kale[6]	This vegetable produces only a fair frozen product. You may wish to omit it in favor of those that freeze very well	.....	.....	Leaves should be young and tender. Do not allow leaves to grow large and coarse
Kohlrabi	This product has color superior to the fresh and is the equivalent of fresh in flavor and texture	Early White Vienna	.....	This vegetable gets bitter and stringy when large and old. Harvest when young and tender
Lettuce	Not suited to freezing	.....	.....	.....
Mushrooms	This product freezes well and should be included in your freezer list if available and if space permits	Cultivated (*Agaricus campestris*)	.....	Should have white, tight caps; medium and smaller sizes best
Muskmelon or cantaloupe	.....	.....	Beauty Osage Bender's Surprise Golden Gopher Sugar Rock Sunrise	Allow to ripen on vine. Use only soft full-slip melons. Is not one of the best products

[4] Corn, Sweet White: Crosby Hybrid (E-45-2) and Country Gentleman give a fair product.
[5] Corn, Sweet Yellow: Other varieties suitable only for cut corn.
[6] Kale: Tall Curled Scotch, and Dwarf Curled Scotch give a fair product.

PLANTING AND HARVESTING GUIDE (*Continued*)

Vegetable	Comments about Freezing, or Quality of Frozen Product	Varieties Producing Best Frozen Product: Excellent and Very Good	Varieties Producing Best Frozen Product: Good	Characteristics Indicating Best Time to Harvest
Mustard Greens	Freezes well. Especially well liked in the South	.....	Florida Broadleaf Southern Giant Curled Fordhook	Cut when leaves are young and tender in spring
New Zealand Spinach	Frozen product mediocre	.....	.....	Young, small leaves
Okra	This vegetable is preserved better by freezing than any other way	.....	Green Velvet Perkins Long Pod Clemson Spineless	Harvest when pods are young and tender. If stems snap when pods are broken from plant, the pod will be tender
Parsnips	Makes an excellent frozen product. More mild in flavor than the fresh	Hollow Crown Marrowfat	.....	Mature parsnips which have been held in ground over the winter are best
Peas[7]	Much of the fine flavor of frozen peas is dependent on variety planted and stage of maturity harvested. Promptness in handling also important	Thomas Laxton Dark Podded Thomas Laxton	Improved Gradus Gradus Laxton's Progress World's Record Glacier Morse's Market Stratagem Dwarf Alderman Hundredfold Stridealong Little Marvel Alderman (Telephone)	Slightly immature peas are better than those which are old and starchy. Try to harvest peas when young and sweet. Pods will be well filled but not tightly filled; pods will still be crisp and bright green in color

Peas, Blackeyed (Field Peas)	This vegetable freezes well	.....	Grand Ramshorn Bluegoose Crowder	Harvest when peas are well filled, but before they are dry. Pods are flexible but not dry
Peppers, Sweet	Although this vegetable loses its crispness when frozen, it freezes well for use in any way one would use the fresh product in cooked dishes	.....	California Wonder Windsor	Peppers should be well formed and crisp. Any indication of soft spots points to over-mature product
Potatoes, Irish	This vegetable makes a satisfactory product; a few packages are handy for hurry-up meals and for enjoying new potatoes over a longer period	.....	Chippewa Katahdin Hoama Bliss Triumph Smooth Rural Green Mountain	Small new whole potatoes are dug when tubers are about 1 inch in diameter; they are frozen immediately. Vines are dry on mature potatoes; dig before a frost and let stand 30 days before freezing
Potatoes, Sweet	Mashed or puréed product best, for pies and baking dishes	.....	Porto Rico Nancy Hall	Allow mature potatoes to age for 30 days before freezing
Pumpkin	Freezes very well. When this vegetable is home grown and freezer space permits, plan on freezing this product	All pie varieties	.....	Let pumpkin ripen on vine and harvest after first frost in the fall
Radishes	Not suited to freezing	.....	.....	.....

[7] Peas: Good varieties also include President Wilson, Onward, Banqueteer, Asgrow 40, Laxton's Cropper, Teton, Laxtonian, Admiral Beatty.

PLANTING AND HARVESTING GUIDE (*Continued*)

Vegetable	Comments about Freezing, or Quality of Frozen Product	Varieties Producing Best Frozen Product: Excellent and Very Good	Varieties Producing Best Frozen Product: Good	Characteristics Indicating Best Time to Harvest
Rhubarb	If you grow this product, plan to freeze some for delicious mid-winter pies	Macdonald Ruby Linnaeus Victoria	All varieties yield a product of good flavor; for good color the deep red colored ones are the best	The early spring cuttings give the finest frozen product; select stalks well colored with red
Rutabagas	This vegetable freezes well and may be preferred instead of turnips if space permits freezing a wide variety of vegetables	.....	Long Island Improved American Purple Top Sweet German (Macomber)	Select those which are young and tender
Spinach[8]	Spinach freezes well. One of the favorites for freezing	Nobel Hollandia King of Denmark Viking Virginia Savoy (Fall Spinach)	Old Dominion Princess Juliana Prickly Winter Viroflay Broad Flanders Long Standing Bloomsdale	Do not let spinach flower before cutting for harvest; cut when leaves are small and tender
Squash, Summer[9]	Does not yield a particularly desirable frozen product	.....	.....	Harvest while tender, before rind hardens
Squash, Winter	Squash freezes very well, but if freezer space is limited you may wish to cellar-store it	Golden Delicious Golden Hubbard	Green Hubbard Blue Hubbard	Allow squash to ripen on vine until fully mature with hard rind

Swiss Chard	This vegetable also yields an excellent frozen product	Lucullus Fordhook Ruby	Other varieties	Cut when leaves are young and tender
Tomatoes	This vegetable does not produce a better frozen product than canned	.....	.....	Select fully mature, firm, vine ripened fruit
Turnips	Turnips freeze very well. Some of the strong flavor is washed out in the preparation procedure	.....	Purple Top Strapleaf White Globe Purple Top White Globe	Select those which are young and tender
Turnip Greens	Freezes very well	.....	Varieties grown especially for greens best	Cut when leaves are young and tender
Watermelon	Can only be frozen successfully as a puréed product	.....	Red-fleshed varieties best	Select fully ripe, vine-ripened melons

[8] Spinach: Victoria is also a good variety. In the East, the Savoy type spinach is superior to the broad leaf type; in the West, the broad leaf type is superior to the savoy leaf type.

[9] Squash, Summer: Summer Crookneck and Zucchini give a fair product.

PLANTING AND HARVESTING GUIDE (*Continued*)

Key: 1—New England; 2—Middle Atlantic States; 3—Southern States; 4—Middle Western States; 5—California; 6—Pacific Northwest States; 7—New York; 8—New Jersey; 9—Tennessee

Fruit	Varieties Producing Best Frozen Product			Maturity Characteristics
	Excellent	Very Good	Good	
Apples	Greening (1, 2, 4, 7, 8) Baldwin (1, 2, 4, 7, 8) Northern Spy (1, 2, 4, 7, 8) Rome Beauty (1, 2, 4, 7, 8) Stayman Winesap (1, 2, 4) York Imperial (1, 2, 4) Grimes Golden (1, 3, 4) Oldenburg (Duchess) (1, 2, 4)	Rome Beauty (6) Stayman Winesap (6) Jonathan (4, 6) Wealthy (1, 2, 7) Yellow Newtown Pippin (6) Spitzenburg (6) Stark (7) Cortland (7)	Gravenstein (5) Yellow Newtown Pippin (7) McIntosh (7) Rome Beauty (5) Winesap (5)	Apples should be firm-ripe, and not mealy; skin should be tight, bright and free from dark spots
Apricots	Tilton (5, 6)	Royal (5, 6) Blenheim (5, 6) Moorpark (5, 6)	.....	Firm-ripe fruit having good yellow color showing practically no green
Avocados (Purée only)	.....	.....	.....	Rind should be of good bright green color without dark blemishes; fruit should feel soft-ripe, not hard or mushy
Blackberries and Dewberries	Boysenberries (3, 5, 6) Youngberries (3, 5, 6) Nectarberries (5, 6)	Loganberries (5, 6) Early Harvest (3) Eldorado (3)	Oregon Evergreen (6) Lucretia (6) Olympic (6)	Should be sweet, soft, and plump, with glossy skin

Blueberries	Concord (7, 8) Rubel (7, 8) Pioneer (7, 8) Rancocas (7, 8) Cabot (7, 8) Jersey (8) Wild Low Bush (1) Wild High Bush (1)	Rancocas (6) June (6) Katherine (6) Jersey (6) Rubel (6)	Adams (6) Harding (6) Cabot (6) Grover (6) Sam (6) Alaska Wild (6)	Pick when sweet and soft
Cherries, Sour	Montmorency (4, 6, 7)	English Morello (4, 7)	.....	Good bright red color, soft-ripe. Use only tree-ripened fruit
Cherries, Sweet	.....	Lambert (5, 6) Bing (5) Black Tartarian (6)	Bing (6, 7) Republican (6) Bacon (6) Napoleon (3, 5, 6, 7) Windsor (7) Lambert (7)	Soft, sweet fully tree-ripened cherries
Cranberries	Howes (1, 2, 6) Early Black (1, 2, 6)	Other varieties satisfactory	.....	Deep red uniform color with glossy skin; pick when still firm, before berry gets mealy
Currants	Perfection (2, 7)	Other varieties very good	.....	Bright red fruit, fully ripe with no green showing on any fruit in cluster
Figs	.....	.....	Mission (5) Kadota (5) Adriatic (5)	Fully tree-ripened fruit best; soft-ripe but before fruit begins to split or become sour
Gooseberries	All varieties	.....	.....	Fully matured, soft, ripe berries best

PLANTING AND HARVESTING GUIDE (*Continued*)

Fruit	Varieties Producing Best Frozen Product: Excellent	Very Good	Good	Maturity Characteristics
Grapefruit	Duncan (3)	Marsh Seedless (3) Seedling (3) Marsh Pink (3)	.....	Fully mature, tree-ripened fruit best. Heaviness indicates good maturity
Grapes	.....	.....	Muscadine (3) Muscat (6) Thomas (3) Thompson Seedless (6)	Grapes do not give a very good frozen product, but if it is desired to freeze this fruit, use only firm-ripe fruit which has developed full flavor on the vine for pies, juice, and jellies, or in mixed fruits
Nectarines	Stanwick (5, 6) Gower (5, 6)	New Boy (5, 6)	.....	Proper maturity very important to retaining good flavor. Should be soft-ripe, same as peaches, but not soft or mushy
Oranges	Valencia (3, 5)	Florida Pineapple (3) Seedling (3)	.....	.....
Peaches	J. H. Hale (1, 2, 3, 4, 5, 6, 7) Hale Haven (1, 3, 4, 7) South Haven (1, 3, 4, 7) Candoka (6) Oriole (2) Primrose (2) Rio Oso Gem (5) Indian Blood (5)	Eclipse (2) Elberta (1, 3, 4, 7) Ideal (7) Massasoit (1, 7) Marigold (1, 7) Vedette (1, 7) Viceroy (1, 7) Veteran (1, 7)	Eclipse (3) Oriole (3) Belle (3)	Good maturity important for flavor; tree-ripened fruit best; pick when fully matured; soft-ripe but not mushy; fruit should be well colored with no green discernible

Pears	.....	.....	Bartlett (1, 5, 7)	Since pears do not give a very good frozen product, particularly good care must be taken in selecting fruit which is neither too green nor too soft and mushy. Should be picked green and left stand to ripen. Good eating indicates best time to freeze
Persimmons	.....	.....	.....	Persimmons freeze best when pulp is puréed; select soft-ripe fruit
Pineapple	Standard market suitable	.....	.....	Fully ripe soft fruit of good color; top leaves will pull out easily when fully ripe
Plums and Fresh Prunes	Italian Prune (5, 6) Stanley (2) Hungarian Prune (2)	Redwing (2, 4, 7) Damson (2, 4, 7, 9) Yellow Egg (2, 4, 7) German Prune (2, 4, 7) Italian Prune (2, 4, 7) Stanley (4, 7)	.....	Proper maturity important for flavor and texture. Fully ripe, sweet fruit that is of good deep color without green. Soft but not mushy. Tree-ripened fruit essential
Pomegranate	.....	.....	.....	Select fully ripe fruit
Raspberries, Black	Bristol (6, 7)	.....	Cumberland (6, 9) Plum Farmer (6) Munger (6) Gregg (6)	Fully matured sweet soft-ripe berries, ripened on vine are best. Pick while berries are plump, before they begin to shrivel

PLANTING AND HARVESTING GUIDE (*Continued*)

Fruit	Varieties Producing Best Frozen Product — Excellent	Very Good	Good	Maturity Characteristics
Raspberries, Purple	Marion (7) Sodus (6, 7) Columbian (6, 7)		.....	Soft-ripe fruit best
Raspberries, Red	Cuthbert (1, 2, 4, 5, 6, 7) Herbert (1) Viking (7) Chief (2, 9) Ranere (St. Regis) (2, 9) Tahoma (6) Washington (6)	Ranere (1, 6) Taylor (7) Lloyd George (6, 7) Viking (6) Cayuga (6) Latham (2, 6, 9) Newburgh (6) Erskine Park (6)	Chief (6) King (6) Herbert (6) Antwerp (6) Utah (6) Marlboro (6)	Cuthbert best flavored variety but difficult to grow in many areas. Soft-ripe fruit best
Strawberries	Marshall (1, 6) Corvallis (6) Klondike (2, 9) Vanrouge (2, 7) Burgundy (2) Blakemore (9)	July Morn (7) Clermont (7) Chesapeake (2, 7) Blakemore (2, 3) Fruitland (2) Big Joe (2) Big Late (2) Klondike (3) Gandy (4) Jersey Giant (4) Dunlap (4) Redheart (6)	Howard 17 (Premier) (1, 4, 9) Bliss (1) Big Late (7) Howard Supreme (1, 2) Fairfax (6, 7) Dorsett (6, 7, 9) Progressive (2, 4) Redheart (2) Missionary (3, 9) Parson's Beauty (4) Gibson (4) Aroma (4) Ettersburg #121 (6) Catskill (1, 2, 7)	Full red color is essential to good flavor; pick vine-ripened berries soft-ripe, but not mushy

Chapter VII

STEP-BY-STEP PREPARATION PROCEDURE

Vegetables, Fruits, Juices, Purées, Meats, Poultry, Fish, Shellfish, and Dairy Products

It is easy to freeze foods even if you have never before tried this new method of food preservation. Freezing will enable you to preserve a wider variety of foods than has been possible before. And you can get surprisingly good results for this is one thing which can be accomplished at home as successfully as it can be done on a commercial scale. But, in order to do this, the freezing rules must be followed carefully. Very briefly they condense to the following ten:

1. Select proper kind and variety of food.
2. Watch maturity of produce; age of meat animals.
3. Plan to prepare for freezing immediately—or refrigerate.
4. First preparation step: prepare for table use.
5. Blanch vegetables; sweeten fruits.
6. Keep product chilled while working with it.
7. Give food adequate packaging protection.
8. Place packaged foods in freezer immediately—or refrigerate.
9. Freeze no more at one time than is recommended for your size freezer.
10. Maintain storage temperature at 0° F.

Five of these rules have been covered separately—variety selected, maturity, speed from harvest to freezer,

proper packaging, and storage temperature—because they are some of the most important factors affecting the success of your freezing venture, and it is best to have a thorough understanding of these freezing principles to insure success with the frozen product. Now let us take a look at the reasons for rules number 5, 6, 8 and 9 before proceeding with detailed directions.

Blanch Vegetables; Sweeten Fruits—Actually, what would happen to fruits and vegetables if they were harvested and frozen without being blanched or treated with sugar would be similar to that experienced when vegetables and fruits are frozen in the garden or orchard by an early frost. The product would be of very poor quality—hardly worth eating; it would retain neither flavor, color, nor texture. The reason for these objectionable changes is the action of enzymes which takes place in the vegetable and fruit tissue.

However, if enzymes are destroyed prior to freezing, the fresh characteristics can be preserved. As pointed out in a previous chapter, enzymes are destroyed by heat at the boiling point. This is easily accomplished in vegetables by heating the vegetable tissue in either boiling water or steam.

Since partially cooked fruits are not usually desired for dessert purposes, it would not be too satisfactory to heat fruit tissue to destroy enzymes. But their action is retarded either by use of dry sugar added to the fruit to make a syrup with juice drawn from the fruit, or by covering the fruit with a prepared sugar syrup. Treatment of fruits with sugar really performs a two-fold action in helping to preserve them: the sugar retards enzymic action during storage; the syrup formed by the solution of the sugar in the juice drawn from the fruit, or the syrup which is poured over fruit, covers the tissues and so re-

tards oxidation (browning) by keeping air from coming in contact with fruit tissue.

Keep Product Chilled While Working With It—Do not allow the product to warm up at any time after preparation has started. As explained previously, the temperature of a food has a direct bearing on loss of nutrients, the warmer the product the more rapid the loss. So it is advisable to start the preparation procedure with comparatively small quantities of food, carrying through to the point of freezing quickly. This is stressed here because of the usual preserving practice of preparing a bushel or two of vegetables or fruit at one time.

As with all rules, the exception to this one is with vegetables; they must be blanched. But—immediately after the vegetable has been blanched for the recommended period, place the vegetable in running cold water or water containing ice, if tap water does not run cold enough, to chill the vegetable down to below 60° F. Allow plenty of time for cooling the vegetable, for it takes at least as long to cool it as it does to blanch it.

Much of the success of your vegetable preparation procedure depends on the prompt and complete cooling of blanched vegetables to retain maximum quality in the vegetable. Oxidation, and loss of flavor and vitamins occur rapidly when vegetables are warm. Also, microorganisms which are the cause of spoilage, multiply rapidly. So if vegetables are not cooled down to at least 60° F., they not only lose flavor and nutrients, but there is danger of spoilage before they are frozen.

Place Packaged Foods in Freezer Immediately—or Refrigerate—Unlike canning, where filled and processed jars are left standing on a table to cool, do not allow packaged products to collect before they are placed in the freezer; but freeze them immediately. If freezing facili-

ties are not at home, then place packages in the refrigerator until the lot can be transferred for freezing; and, if packages are placed in the refrigerator before being transferred, be certain to remove them to the freezer at the first possible opportunity; do not, under any consideration, leave packaged products in the refrigerator for any length of time before transfer.

Even at 50° F., bacterial action is relatively rapid. Unless foods are promptly frozen spoilage is likely to occur; at best, the frozen product will develop off-flavor, loss of color, and nutrient content.

When packages are transferred from home to freezing facilities, do not allow the food to warm up during transfer. Pack the packages in a corrugated fiberboard carton for transportation.

Freeze No More at One Time Than Is Recommended for Your Size Freezer—If too many packages of unfrozen food are tightly packed in a freezer the rate of freezing is so slow that spoilage is likely to occur before the temperature of the food is brought down to 0° F. So do not plan to freeze more packages or pounds of products at one time than is recommended for your size freezer. Carefully follow the manufacturer's directions concerning this. However, if locker space is rented, or sharp freezing facilities of a locker plant are used for freezing, actual freezing of food can be undertaken on a much larger scale.

If products are frozen in a small home freezer (4 or 6 cu. ft.) usually no more than 10 or 15 pounds of food may be frozen at one time. Larger freezers of 24 or 36 cu. ft. size will freeze as much as 30 or 40 pounds at one time. After products are frozen, a home freezer may be packed tightly full of frozen packages for storage.

When freezing foods in a home freezer, much faster

freezing takes place if packages are placed against the side walls or on metal freezing plates or shelves, and spaced so there is ample air circulation around packages while they are being frozen.

Vegetables

Not very much "special" equipment is needed to prepare foods for freezing at home other than the proper supply of packaging materials. Most of the equipment needed for preparing vegetables is regular kitchen utensils; some can even be improvised from articles on hand:

1. Sharp knives for trimming, paring, slicing, etc.
2. Necessary bowls or pans for washing vegetables.
3. Long-handled colander or wire mesh basket (similar to those used for French frying) in which to place the vegetables for the blanching operation.
4. A large preserving kettle of 6 to 12 quart capacity for blanching; or, a "steamer" consisting of a large kettle with a tight-fitting cover, fitted with a rack at the bottom on which the colander or wire basket containing the vegetables can rest for the steam-blanching operation.
5. Plenty of running cold water; or, ample amounts of ice for water to chill vegetables after blanching.
6. Packaging materials. (See illustrations facing page 112.) The recommended cartons and containers for vegetables are: (A) Rectangular end-opening folding waxed carton equipped with bag-liner. (B, F, G) Rectangular top-opening folding waxed carton with liner in small, medium and large sizes. (C) Heavily waxed tub- and cup-shaped containers. (D, E)

Rectangular containers that are heavily waxed with over-lapping heat-sealing closure (like D) or with metal slip-in lids (like E).

7. An electric hand iron, curling iron, or heat-sealing iron for heat-sealing packages.
8. A cheesecloth-covered "block" to facilitate heat-sealing. (This is helpful but not essential to good packaging. It can be made from any block of metal or wood, just so it is of a height that the top of bag-liners can be heat-sealed on top of it when the carton stands upright alongside the block.)
9. Frame-and-funnel to hold end-opening cartons upright and the bag-liner in shape while filling. (This, too, is helpful but not essential to good packaging. It may also be improvised from a tin can which has had the top and bottom smoothly removed and then shaped into an oblong "funnel" at one end.)
10. China-marking pencil or soft crayon for labeling packages. Packages are labeled indicating contents, date packed, and name or locker number if locker plant service is used.

How to Blanch Vegetables Properly

Since blanching of vegetables is regarded as the most important step in their preparation for freezing, it is best to understand thoroughly the two methods of blanching: water-blanching and steam-blanching; and why sometimes one is recommended, and sometimes the other.

Water-blanching is the method when boiling water is used as the blanching medium. To water-blanch, only about one pound of vegetables at a time is put in a long-handled colander or wire basket which is then placed into

boiling water for the recommended time. At the end of the blanching period the vegetables are removed and promptly cooled by running cold water or water containing ice.

Steam-blanching is the method using steam as the blanching medium. In order to steam-blanch vegetables, a steamer, as previously described, must first be procured. To steam-blanch, water to the depth of about one inch in the bottom of the steamer is brought to a full rolling boil; about one pound of the vegetable is placed in the wire basket or colander which is then placed on the rack in the steamer (over the boiling water); the steamer is covered tightly, and the recommended steaming time is counted. A good steamer should have a cover which fits tight enough to prevent steam from escaping freely.

Steam-blanching takes longer than water-blanching; usually from one to two minutes more time is required. But it is recommended in some instances rather than water-blanching because this method may preserve more water-soluble nutrients, especially when blanching cut-up vegetables such as Frenched green beans, diced turnips, etc. In the case of sweet corn, for example, much of the milk of the cut kernel would be leached out of kernels were the corn placed in boiling water to blanch, whereas there is little milk lost during steaming of cut kernels. Likewise, more of the water-soluble vitamins of the vegetable may be dissolved when blanching is done in boiling water rather than by steam.

On the other hand, boiling water blanches more uniformly such vegetables as spinach, kale, Swiss chard, turnip and beet greens, and broccoli.

There are four precautions to take in order to insure proper blanching; and it must be remembered that adequate blanching is important, otherwise quality may be

poor: (1) Be sure that the water has come to a full rolling boil *before* vegetables are placed in the blanching medium. (2) Time the procedure accurately with the second hand of a watch or clock and count the time *only* from the time the water again comes to a full rolling boil *after* vegetables have been put in place. Accurate timing is important to prevent both under- and over-blanching. Under-blanching is likely to result in spoilage; over-blanching causes a great loss in color, flavor, and nutrients and the frozen product will be of poor quality. (3) Adequate water-blanching cannot be accomplished if too many vegetables are blanched in too little water in too small a vessel; just so, adequate steam-blanching cannot be accomplished unless enough heat is available to produce a large quantity of steam rapidly. Therefore only small amounts should be blanched at one time in a large quantity of boiling water or steam. For this reason a 6- to 12-quart kettle is recommended for water-blanching, using at least one gallon of water per pound of produce. At least a 6-quart kettle is recommended for steam-blanching one pound of vegetables. (4) So that all surfaces of the vegetables are uniformly treated during water-blanching, agitate the basket or colander containing the vegetables. This is especially important in the case of leafy greens such as spinach, the leaves of which have a tendency to mat down and stick together preventing uniform blanching if the product is not agitated during the blanching period.

If you live at an altitude of over 2,500 feet, additional time will have to be given the blanching period in order to adequately blanch vegetables. At altitudes of from 2,500 to 5,000 feet, blanch vegetables one-half again as long as the recommended times given for blanching on pp. 109 to 126; at altitudes over 5,000 feet, blanch vegetables twice as long.

Brine Vs. Loose Vs. Dry Pack

There has been conflicting—and sometimes inaccurate—information published about the three different ways of packaging vegetables for freezing. For example, information has been widespread that unless vegetables are packaged in a brine solution (salt and water) they will not keep in storage for longer than 3 to 6 months. Actually, this is not true, proven so by freezer tests. It is the *storage temperature* and not the brine solution which is the governing factor for length of storage. Information has also been circulated that much of the nutritive value of vegetables is lost if they are packaged in brine solution. Neither is this statement altogether true. *If* the vegetables are cooked in the brine and the brine served and eaten along with the vegetables the water-soluble nutrients dissolved into the brine will be consumed, no more being lost than in other methods of freezing vegetables.

An attempt is here made to explain the procedure of each method and discuss their relative values, leaving the ultimate decision of packaging procedure up to the reader, although in the authors' opinion the dry packaging of vegetables has the most advantages.

Dry Pack—When vegetables have been blanched, cooled, and drained, merely fill the cartons or containers full with the vegetable, close the package, heat-seal if necessary, and label. Dry-pack vegetables (except greens which pack solidly and consequently require headspace) should be filled to the top of the carton or container, leaving as little air space in the package as possible. There is no need to allow headroom for expansion during freezing as this pack does not expand appreciably when frozen.

There are no apparent disadvantages to the dry-pack method of packaging vegetables. It is the easiest way

to package vegetables. Texture and color seem to be retained at least as well as when the brine pack is used. And since it is recommended that frozen vegetables be cooked when frozen or partially frozen, the dry pack vegetables are easier to remove from some types of containers than those packed in brine.

Brine Pack—Fill packages to within $^3/_4$ to 1 inch from top to allow headroom for expansion of the brine during freezing. Prepare a brine solution of 1 tsp. salt to each cup of cold water; pour brine over vegetables just to cover; close package, heat-seal if necessary, then label.

When packaging vegetables with brine, be certain that bag-liners used with folding waxed cartons are water-tight and that heavily waxed containers using no liners are also water-tight.

Salt seems to accelerate rancidity in some vegetables producing objectionable off-flavors within considerably short storage periods. And some vegetables such as spinach will become soupy because of the additional liquid on the vegetable.

If brine-pack vegetables are frozen, less salt—sometimes none—is added to the vegetable at cooking time. Also, cook vegetables in the brine in which they were packed without adding more water unless the vegetable boils dry, so that none of the nutrients dissolved into the brine will be lost. It also takes brine-pack vegetables slightly longer to thaw and cook for there is more liquid which has to be thawed and brought to the boiling point.

Loose Pack—This is a more detailed procedure for home freezing, although peas, beans, and lima beans have been frozen by loose pack very successfully.

To freeze vegetables by the loose-pack method (after blanching, chilling, and draining), spread vegetables out on small trays (or pie tins), place in freezer to freeze;

then remove trays and scrape the frozen vegetables loose and pack in cartons or containers, filling them full; close package, heat-seal if necessary, label, and place in the freezer for storage.

Loose-pack vegetables can be frozen very successfully in a home freezer, but as can be seen by the above procedure, it takes more time and requires much more trouble. In addition, more storage space is required for loose-pack vegetables since the frozen vegetables do not pack as compactly as the unfrozen ones. For instance, a carton which will hold 12 ounces of cauliflower when dry packed, will hold only 8 or 9 ounces when loose packed.

Directions for Preparing Vegetables

Following is the step-by-step procedure for freezing all vegetables, except those which are not recommended for freezing. For information concerning these, turn to the *Planting and Harvesting Guide* on pp. 85 to 93.

ARTICHOKES, GLOBE

Prepare: Outer bracts should be pulled from the globe artichokes until the inner light yellow or white bracts free from all green are reached. The tops of the buds should be cut off and the butt trimmed to a cone. As soon as they have been trimmed, the hearts should be submerged and washed in cold water.

Blanch: For 7 minutes in boiling citric acid solution prepared by dissolving 1 tbsp. citric acid (or $^1/_2$ cup lemon juice) in 3 qts. water.

Chill: In running cold water for about 5 minutes.

Package: D, F, and G types recommended.

A few packages in your freezer will provide wonderful company fare for grand occasions.

ASPARAGUS

Prepare: Since asparagus toughens quickly and loses flavor rapidly after harvest, it is advisable to freeze this vegetable within 2 or 3

hours after cutting, if at all possible. Use only upper 6 inches of spear; separate spears into small stalks (3/8 to 3/4 inch butt-end) and large stalks (3/4 to 1 inch butt-end). Trim stalks, wash in cold water. If cut up spears are desired, cut stalks in 2-inch pieces before blanching.

Blanch: Steam-blanch preferred; although a satisfactory product can also be obtained by water-blanching.

Steam-blanch small stalks: 3 1/2 min.; large: 4 1/2 min.
Water-blanch small stalks: 3 min.; large: 4 min.

Chill: In running cold water for 3 to 5 minutes.

Package: A, B, and D types recommended for cut-up asparagus; F or G type for whole spears.

If you have a bed of asparagus freeze every tender tip you don't use fresh, then enjoy it months later. Serve it as a hot vegetable, or cook and chill it to add a delicious flavor to salads.

BEANS, GREEN SHELL

Prepare: Shell the beans, but do not wash them after being shelled. It is best to shell a quantity before starting the blanching procedure.

Blanch: Steam-blanching preferred; more flavor and nutrients retained.

Steam-blanch: 105 sec.
Water-blanch: 60 sec.

Chill: In cold running water for about 3 minutes.

Package: A, B, C, D, and E types recommended.

Frozen shell beans are much more flavorful than those dried; they give wonderful variety to vegetable plates.

BEANS, GREEN SNAP

Prepare: Broken snap beans also lose their fine flavor and texture rather rapidly after harvest; freeze them within a few hours if at all possible. Wash them free of soil and foreign particles in cold running water; snip off tips; cut in 1-inch lengths for cut beans; small beans (3 to 4 inches long) may be frozen whole; or, if a French slicing utensil is available, the beans may be Frenched by putting them through the slicer lengthwise.

Blanch: Water-blanch preferred for cut or whole beans; steam-blanch for French style.

Water-blanch cut beans: 2 min.; whole: 2½ min.; Frenched: not recommended.

Steam-blanch cut beans: 3 min.; whole: 3½ min.; Frenched: 2 min.

Chill: In cold running water for from 3 to 5 minutes.

Package: A, B, C, and D types recommended.

Green snap beans may be used instead of limas with kernel corn for succotash; cook them with onions and salt pork or bacon drippings for Southern Style; with vinegar and ham for German Style; creamed with onions for a change, too.

BEANS, LIMA

Prepare: Some varieties of lima beans are exceedingly difficult to remove from pods; a pair of kitchen shears may be used to cut off tough edges of pods, giving easy access to beans. Do not wash beans after being shelled, but shell a quantity before beginning blanching.

Blanch: Water-blanch preferred.

Water-blanch small: 1 min.; medium: 1½ min.; large: 2 min.

Steam-blanch small: 2 min.; medium: 2½ min.; large: 3 min.

Chill: Immediately immerse in running cold water for about 5 minutes.

Package: A, B, C, and D types recommended.

You may wish to save some of your limas to freeze with kernel corn for very delicious succotash; frozen limas cooked with scallions, cooked in Creole sauce are delicious vegetable combinations; cook, chill, and serve frozen lima beans, too, in salads.

BEANS, SOY

Prepare: Soy beans are difficult to shell, but if pods are scalded in boiling water for about 4 minutes and then cooled in running cold water, this task is made much easier. No further blanching is necessary, but be sure to completely cool the beans for at least 5 minutes before shelling them. They can be shelled directly into cartons or containers for freezing.

Package: A, B, C, and D types recommended.

Because of their brilliant green color, soy beans are especially attractive on a vegetable plate, or as the vegetable accompaniment to such meats as liver, sweetbreads; they also make tasty casserole dishes.

BEANS, WAX

Follow directions given for *BEANS, GREEN SNAP*, page 110.

BEETS

Prepare: Cut tops off beets, scrub well in cold running water. Beets which are very small and tender (maximum $1\frac{1}{2}$ or $1\frac{3}{4}$ inch in diameter) may be frozen whole; pare small whole beets before blanching. Blanch all others in the skins.

Blanch: Whole beets—steam-blanch (preferred): $3\frac{1}{2}$ min.; water-blanch: $2\frac{1}{2}$ min. All other beets—*Cook until tender.*

Chill: Whole beets—in running cold water for about 5 minutes. Other beets—in running cold water for about 5 minutes; then rub off peels and slice or dice directly into packages for freezing.

Package: A, B, C, and D types recommended.

Here is a way to prepare beets with a "ting!": Heat $\frac{1}{2}$ cup heavy cream, $3\frac{1}{2}$ tsp. prepared horseradish, and $1\frac{1}{2}$ tsp. salt in saucepan; add beets and heat to serving temperature.

BEET GREENS

Prepare: Prepare for freezing just as soon as possible after harvesting. Wash thoroughly in running cold water to eliminate soil and foreign particles. Discard any coarse or yellow leaves.

Blanch: Water-blanch preferred; agitate basket during blanching period.

Water-blanch: 2 min.
Steam-blanch: 3 min.

Chill: In running cold water for about 5 minutes.

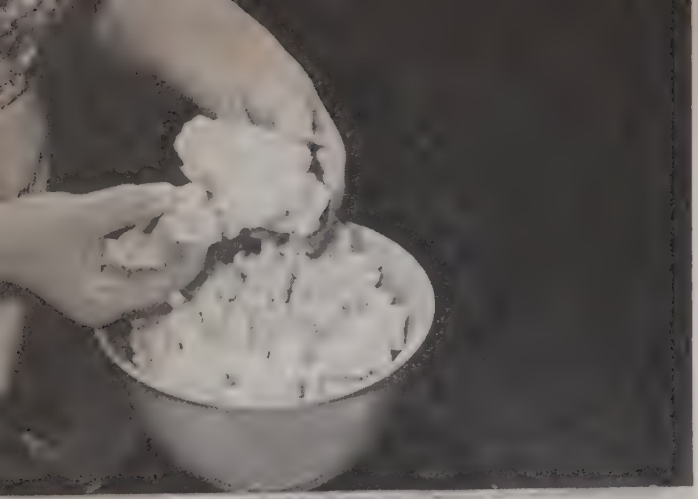
Package: A, B, C, and D types recommended.

Freezing is a marvelous way to preserve the succulence of those tender green tops with tiny beet-roots which you thin out of your rows of growing beets; they are one of the most delicious greens you can prepare; so don't waste them.

BROCCOLI

Prepare: Wash thoroughly in running cold water, eliminating coarse leaves. Cut head into pieces not thicker than 1 inch and not longer than 5 to 6 inches. Separate into small, medium, and large for blanching.

ypes of packaging for freezing vegetables: A. Waxed end-opening folding carton with heat-sealing bag-
ner; B. Waxed top-opening folding carton with moistureproof Cellophane liner; C. Heavily waxed Lily
ulip frozen food container; D. Heavily waxed heat-sealing Dacca container; E. Heavily waxed Vapocan
th metal slip-in lid; F. Large top-opening folding carton with or without moistureproof Cellophane liner;
G. Large top-opening folding waxed carton with attached wrapper for easy heat-sealing.



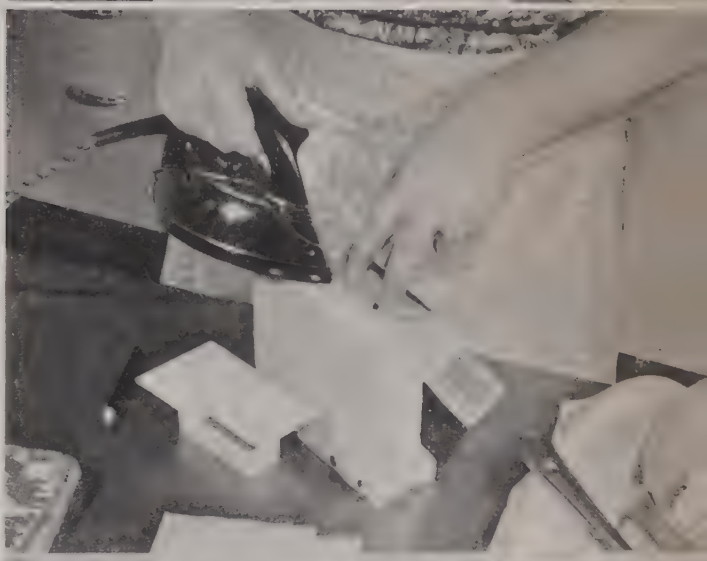
First step in preparing vegetables for freezing: wash in cold running water, trim for table use. Large vegetables should be cut into pieces, sliced, diced, or broken into flowerettes as here illustrated with cauliflower.

Second step: blanching vegetables. Water-blanching is shown here. Use large quantity of water and small amount of vegetables. Have water boiling rapidly. Immerse vegetables. Count blanching time when water boils again *after* immersing vegetables.

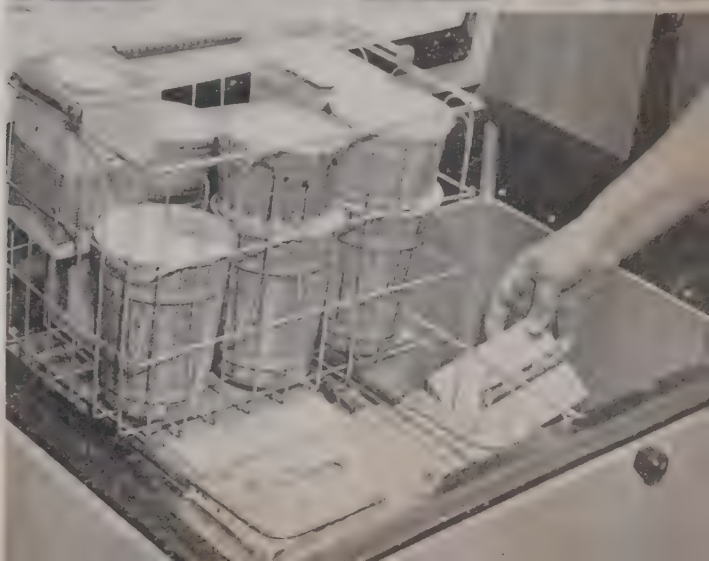
Third step: chilling vegetables. Importance of this step following the blanching should not be overlooked. It is bad practice to package any warm food for freezing. If tap water is not cold enough, add ice.

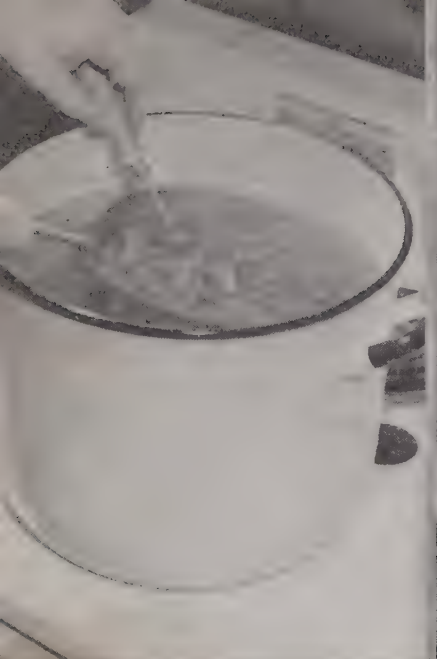
Fourth step: packaging vegetable. Select package suitable to size, shape of product. If packed dry, fill package full, except greens. During freezing greens may bulge the package and break the seal if packed too full.

Fifth step: sealing package. With bag-in-box type of carton, tip of warm iron (or curling iron) is pressed over double fold in top of bag and carton is closed. Carton may be labelled before it is filled, or after, indicating contents and date packed.



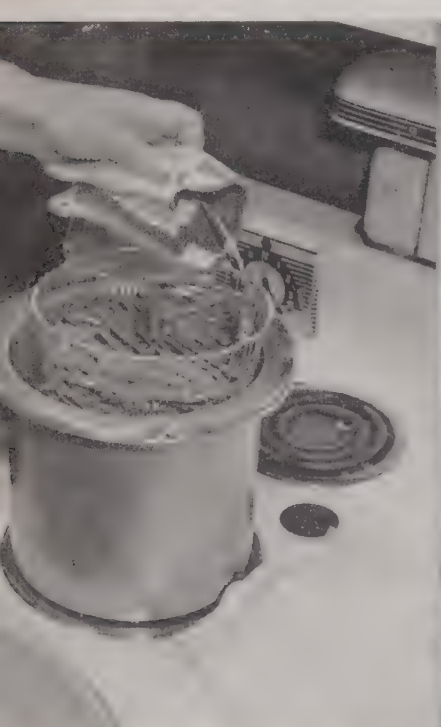
Sixth step: freezing. Place finished packages immediately in freezer, or in refrigerator if they are to be frozen at a locker plant. If frozen in a home freezer, follow manufacturer's freezing directions carefully.



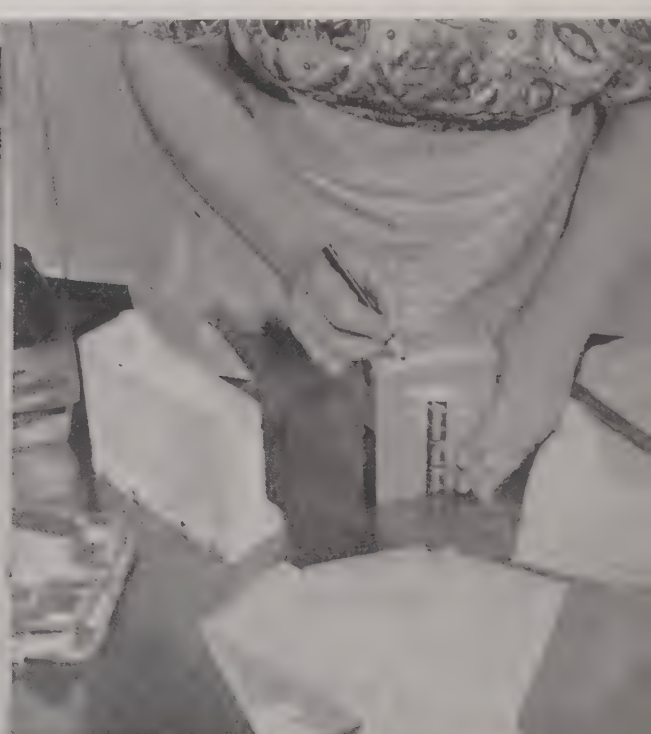


Agitate vegetables during water-blanching as here illustrated, especially greens such as spinach or chard, to insure uniform blanching.

To freeze mixed vegetables, prepare, blanch and chill eac vegetable separately, drain, and then mix together in desire proportions. Or, instead of mixing, they may be packaged sections such as the peas and carrots shown above.



When vegetables are shredded, Frenched, cubed or diced (such as these Frenched green beans) it conserves nutrients to blanch by steam rather than by water.



A china-marking pencil or soft crayon is recommended fo labeling. Besides contents and date, indicate name or locke number if frozen at locker plant. If product is frozen for special purpose, this information is also helpful.

Blanch: Water-blanch preferred; agitate basket during blanching period.

Water-blanch small: 3 min.; medium: 4 min.; large: 5 min.
Steam-blanch small: 4 min.; medium: 5 min.; large: 6 min.

Chill: In running cold water for 4 or 5 minutes.

Package: B or G type recommended.

Broccoli with Parmesan cheese? It's good! Sprinkle grated Parmesan cheese mixed with about 1/4 tsp. salt over cooked broccoli before serving.

BRUSSELS SPROUTS

Prepare: Cut sprouts from main stem; wash thoroughly in running cold water; trim off outer coarse leaves; discard insect-infested sprouts.

Blanch: Water-blanch preferred.

Water-blanch: 4 min.
Steam-blanch: 5 min.

Chill: From 6 to 8 minutes in running cold water.

Package: B, C, and D types recommended.

Freezing gives new interest to this vegetable, because up to now there has been no satisfactory way of preserving it. Plan to freeze a few packages; delicious and attractive served with ham, or steaks.

CABBAGE

Prepare: Trim outer coarse leaves from heads; then either shred heads medium to coarse on cabbage shredder, or with sharp knife separate into "leaves."

Blanch: Steam-blanch preferred.

Steam-blanch: 2 min.
Water-blanch: 1 1/2 min.

Chill: Shredded cabbage 2 minutes; leaves 3 minutes, in running cold water.

Package: A, B, C, and D types recommended.

Remember this vegetable frozen can be used only in cooked dishes, but it makes a very fine product, mild tasting and tender textured. Excellent for stews, creamed, and in vegetable casserole dishes for different flavors.

CANTALOUPE

This product is treated like fruit and directions for preparing it are given under "FRUITS," p. 133.

CARROTS

Prepare: Top, and wash in running cold water; scrape. Small, tender carrots may be frozen whole; or may be cut into 1/4-inch slices; or Frenched if a French slicing utensil is available (run carrots through slicer lengthwise).

Blanch: Water-blanch preferred.

Water-blanch Frenched: 2 min.; slices: 3 min.; whole: 4 1/2 min.

Steam-blanch Frenched: 2 min.; slices: 3 min.; whole: 4 1/2 min.

Chill: In running cold water for about 5 minutes.

Package: B or G type recommended for whole carrots; A, B, C, and D types for sliced.

If you plan to freeze vegetable mixtures, save some of your young, tender carrots for peas and carrots, and with any mixture of your own choosing. Minted carrots, parsley carrots, and French style carrots with shredded onion are a few out of the ordinary ways of serving this ordinary vegetable cooked.

CAULIFLOWER

Prepare: Prepare head as for table use, cutting head into pieces not thicker than 1 inch. Separate pieces into small and medium before blanching.

Blanch: Water-blanch preferred.

Water-blanch small: 3 min.; medium: 4 min.

Steam-blanch small: 4 min.; medium: 5 min.

Chill: In running cold water 4 to 5 minutes.

Package: B or G, C, and D types recommended.

Cooked and chilled cauliflower and green beans tossed together with a zippy French dressing make a different and delightful salad.

CELERY

Prepare: Trim stalks for table use, washing thoroughly in running cold water. Cut stalks into 1-inch pieces.

Blanch: Cook until tender using either steam or small amount of water.

Chill: Float pan containing vegetable in cold water, stirring frequently until completely cooled.

Package: A, B, C, and D types recommended.

This vegetable, too, can be used only for cooked dishes when frozen, but there will be many times you will be glad to have a few packages in the freezer for flavoring casserole dishes, for serving creamed celery, making celery soups, etc.

CHINESE CABBAGE

Prepare: Cut individual leaves from stem; wash thoroughly in running cold water to eliminate soil and foreign particles; discard outer leaves which may be bruised.

Blanch: Water-blanch preferred; agitate basket during blanching period.

Water-blanch: 70 sec.
Steam-blanch: 2 min.

Chill: In running cold water for about 5 minutes.

Package: A, B, C, and D types recommended.

You may be familiar with Chinese cabbage flavor in wonderful salads, but as a frozen and cooked product it may be a new experience for you. Try it. You'll like the flavor of it cooked as well.

COLLARDS

Prepare: Wash thoroughly in running cold water, cutting out and discarding stem and coarse leaves.

Blanch: Water-blanch preferred; agitate basket during blanching period.

Water-blanch: 2 min.
Steam-blanch: 3 min.

Chill: In running cold water for about 5 minutes.

Package: A, B, C, and D types recommended.

If your family is addicted to greens in any form, this is a vegetable which should be included on your freezing list. It freezes well retaining fine flavor.

CORN, SWEET

Prepare: Sweet corn loses texture and flavor rapidly after harvest, so freeze as soon as possible. Husk, eliminating under- and over-mature ears. It is strongly recommended that corn be blanched first on the ears, then cut for kernel corn, otherwise milk loss is likely to be great and much of the flavor is lost.

Blanch: Steam-blanch preferred; blanch no more than 6 ears at a time.

Steam-blanch small ears: $6\frac{1}{2}$ min.; medium: $8\frac{1}{2}$ min.; large: $10\frac{1}{2}$ min.

Water-blanch small ears: 6 min.; medium: 8 min.; large: 10 min.

Chill: In running cold water for at least 10 to 15 minutes.

Package: Corn on cob—Wrap each ear individually in moisture-proof Cellophane, then pack in large rectangular folding carton, overwrap with Cellophane, heat-seal.

Whole Kernel Corn—Cut kernels from cob, cutting deep enough to get whole kernels; separate bits of cob by washing in large pan of cold water, then letting kernels settle to bottom of pan and skim out pieces of cob on or near surface with sieve or colander; package in A, B, C, and D type packages.

Alternative Procedure: If you prefer to cut kernels from cob before blanching, steam-blanch not more than one cup of cut corn at a time, steaming for $2\frac{1}{2}$ minutes. Cool immediately in running cold water for about 5 minutes; eliminate pieces of cob as described above; drain and package.

Try kernel corn pan fried, or baked in casserole in oven; try corn on cob brushed with melted butter and baked in hot oven—these are good ways of serving corn without camouflaging its flavor with other vegetables or seasonings.

EGG PLANT

Prepare: Peel; either slice in $\frac{1}{3}$-inch slices, or dice in $\frac{1}{3}$-inch cubes.

Blanch: Water-blanch preferred.

Water-blanch: 4 min.

Steam-blanch: 5 min.

Chill: First dip it momentarily in a 2 per cent citric acid solution,

Prepare citric acid solution by dissolving 1 tbsp. citric acid (or 1/2 cup lemon juice) in 2 1/2 pts. cold water. Then chill in running cold water for 4 minutes.

Package: B or G type recommended for slices; A, B, C, and D types for cubes.

Combined with tomatoes, green pepper, onion, seasonings, and bread crumbs, frozen egg plant makes a delicious casserole; or toss cubes in flour and sauté to a golden crispness for another taste treat.

KALE

Prepare: Wash thoroughly in running cold water; cut off and discard main stem.

Blanch: Water-blanch is preferred; agitate basket during blanching period.

Water-blanch: 70 sec.
Steam-blanch: 2 min.

Chill: In running cold water for about 5 minutes.

Package: A, B, C and D types recommended.

Greens may be served scalloped or au gratin just as well as they can be served any other way; just prepare as you would any scalloped or au gratin dish with cream sauce and bread crumbs or cheese.

KOHLRABI

Prepare: Cut off tops; wash thoroughly in running cold water; peel, then dice in 1/2-inch cubes.

Blanch: Steam-blanch is preferred.

Steam-blanch: 100 sec.
Water-blanch: 60 sec.

Chill: In running cold water for about 5 minutes.

Package: A, B, C, and D types recommended.

Tasty additions to kohlrabi for glorious seasonings are either a few drops of lemon juice, minced parsley, or chives; add to the cooked and buttered vegetable.

MIXED VEGETABLES

Prepare: Each vegetable must be prepared separately including the blanching, blanching each vegetable according to the time given for each. After blanching and chilling, vegetables are mixed together and packaged.

Combinations: For succotash use equal portions of kernel corn and either lima beans, soy beans or green snap beans; use equal portions also for peas and carrots.

For mixed vegetables a combination of 1 1/4 cup kernel corn, 1 cup green beans, 1 cup carrots, 3/4 cup lima beans, and 1 cup peas makes a good mixture. If desired, 1/2 cup celery and 1/2 cup turnips may be added to the above combination. In preparing such a vegetable mixture as here suggested, you will find the season for peas is usually over by the time such vegetables as corn or lima beans come in. In such cases, use the required amount of peas from your supply of the frozen vegetable, allowing them to thaw partially before mixing with the other freshly blanched and chilled vegetables.

Package: A, B, C, and D types recommended.

Frozen mixed vegetables are particularly nice for succotash, casserole dishes, and when cooked and chilled can be made into attractive, tasty salads.

MUSHROOMS

Prepare: During pulling and trimming, care should be taken to prevent bruising since bruised mushrooms soon discolor. They deteriorate rapidly after harvest, so should be prepared and frozen the same day they are picked. Wash thoroughly in running cold water to remove soil, cut off base of stem. They may be frozen as large whole mushrooms, as buttons, or as sliced mushrooms. Sort whole and button mushrooms into small and large sizes for blanching.

Blanch: Steam-blanch preferred. Be careful not to over-blanch for it can cause excessive shrinkage.

Steam-blanch slices: 3 min.; small: 3 1/2 min.; large: 4 1/2 to 6 min.

Water-blanch slices: 2 min.; small: 3 min.; large: 4 to 5 1/2 min.

Chill: First chill mushrooms in running cold water for 2 minutes, then cool them in a 2 per cent citric acid solution (prepared by dissolving 1 tbsp. citric acid or 1/2 cup lemon juice in 2 1/2 pts. cold water) for 2 minutes. Then chill again in running cold water for 2 minutes. Drain well (15 to 20 min.) before packaging.

Package: B or G type recommended for whole or buttons; A, B, C, and D types for slices.

Mushrooms freeze very well, and there's no denying the advantage

of having a few packages of them in the freezer to add that epicurian touch for otherwise plain fare for unexpected company who always relish mushroom sauce and gravy.

MUSKMELON

This product is treated like fruit and directions are given under "CANTALOUPE," p. 133.

MUSTARD GREENS

Prepare: Wash thoroughly in running cold water to rid leaves of dirt; cut off and discard main stem of leaves.

Blanch: Water-blanch preferred; agitate basket during blanching period.

Water-blanch: 50 sec.
Steam-blanch: 90 sec.

Chill: In running cold water for about 5 minutes.

Package: A, B, C, and D types recommended.

Try seasoning mustard greens with salt pork or bacon drippings and a little vinegar, if you get tired of serving them plain.

NEW ZEALAND SPINACH

Prepare: Wash thoroughly in running cold water to rid leaves of dirt; cut off and discard main stem.

Blanch: Water-blanch preferred; agitate basket during blanching period.

Water-blanch: 70 sec.
Steam-blanch: 2 min.

Chill: In running cold water for about 5 minutes.

Package: A, B, C, and D types recommended.

Like other greens, this vegetable may be puréed, made into scalloped or au gratin casserole dishes, used to flavor soups and stews, etc.

OKRA

Prepare: Wash young, tender pods thoroughly to clean off soil; cut off stems. Separate into small and large pods before blanching.

Blanch: Steam-blanch preferred.

Steam-blanch small pods: 3 min.; large pods: 4 min.
Water-blanch small pods: 2 min.; large pods: 3 min.

Chill: In running cold water for about 5 minutes.

Package: B or G, C, and D types recommended.

Fried okra, the way it is prepared down South is a real vegetable treat. Toss okra with buttered bread crumbs; melt 2 tbsp. fat in hot skillet, sauté okra to a delicate golden brown.

PARSNIPS

Prepare: Cut off tops, wash thoroughly in running cold water peel, then dice in $^1/_2$-inch cubes; or, split lengthwise in slices $^3/_4$-inch thick.

Blanch: Steam-blanch preferred.

Steam-blanch cubes: 100 sec.; slices: 3 min.
Water-blanch cubes: 60 sec.; slices: 2 min.

Chill: In running cold water for about 5 minutes.

Package: A, B, C, and D types recommended.

Freezing does something for parsnips, making them milder in flavor with the sweet flavor seeming more pronounced. They are delicious prepared any number of ways: fried; mashed and mixed with seasonings, then rolled in buttered bread crumbs and baked in the oven (as croquettes); or just mashed and seasoned.

PEAS

Prepare: Shell out a quantity before starting to blanch; do not wash after peas are shelled. Discard those peas which are starchy.

Blanch: Water-blanch preferred.

Water-blanch small peas: 45 sec.; large peas: 60 sec.
Steam-blanch small peas: 90 sec.; large peas: 2 min.

Chill: For about 3 minutes in running cold water.

Package: A, B, C, and D types recommended.

This is one of the standby vegetables. You probably will want to freeze a lot of it. Try to catch the first harvests of the season for your freezing quota.

PEAS, BLACKEYED (FIELD)

Prepare: Shell a quantity before starting the blanching procedure; do not wash after peas are shelled; discard those peas which are hard.

Blanch: Water-blanch preferred.

Water-blanch: 2 min.
Steam-blanch: 3 min.

Chill: In cold running water for about 5 minutes.

Package: A, B, C, and D types recommended.

Blackeyed peas have a special meaning all their own to those who live where they are grown; being one of those vegetables in great demand, you will probably want to freeze a quantity of this vegetable, for it makes an excellent frozen product.

PEPPERS, SWEET

Prepare: Wash peppers, trimming out stem and seeds. They may be frozen in halves, or cut in slices.

Blanch: Either boiling water or steam provides satisfactory blanching.

Water-blanch slices: 2 min.; halves: 3 min.
Steam-blanch slices: 3 min.; halves: 4 min.

Chill: In running cold water for several minutes until cool.

Package: B or G type recommended for halves; A, B, C, and D types for slices.

Frozen green pepper halves may be stuffed and baked with a stuffing, just as fresh are; freeze slices in smaller packages for use in creole sauces, flavoring in casserole dishes, etc.

POTATOES, IRISH

Prepare: For French Frying—Select mature potatoes which have been stored for 30 days. Wash, peel, cut into $^1/_8$-inch sticks.

New Potatoes—Dig potatoes when they are about the size of walnuts; wash clean of soil, and scrub vigorously to remove tender skins (no paring will be necessary, although they may be scraped if desired).

Blanch: Either boiling water or steam is satisfactory for preparing the potato sticks; steam is preferred for preparing the small new potatoes.

Water-blanch sticks: 2 min.
Steam-blanch sticks: 3 min.; walnut-size new potatoes: 5 min.

Chill: For 3 to 5 minutes in running cold water.

Package: B, C, D, F, or G type recommended.

French fries and new potatoes are grand items for the freezer. Potatoes ready for French frying seem made to order for hurry-up

meal preparation; new potatoes in the freezer give greater pleasure longer from this short-lived garden treat. You may also wish to freeze peas with your new potatoes, for creamed new potatoes and peas.

POTATOES, SWEET

Prepare: Select fully mature, cured sweet potatoes, wash. Cook potatoes until soft; allow to stand at room temperature to cool. Then peel the potatoes and either mash or slice. Dip slices for 5 seconds in citric acid solution containing 1 tbsp. citric acid (or ½ cup lemon juice) to 1 qt. water. If potatoes are to be mashed, dip the peeled potatoes in the citric acid solution for 5 seconds before mashing.

Package: B, C, D, F, or G type recommended for slices; B, C, and D types for mashed.

Sweet potatoes freeze very well and for such delicacies as sweet potato pie it is nice to have some packages on hand at any time.

PUMPKIN

Prepare: Peel; cut in 1-inch cubes.

Blanch: Steam is preferred; and *steam* the pumpkin *until soft;* then mash.

Chill: Cool quickly by floating pan in running cold water.

Package: B, C, and D types recommended.

Freeze your own pumpkin for pies, or the pie mix all ready to pour into pie shells can be prepared by adding seasonings, etc. In freezing the pie mix, remember to add slightly more seasonings than usual for they seem to lose some of their flavor during storage.

RHUBARB

Prepare: Cut off top leaves; wash thoroughly in running cold water; cut into 1-inch lengths.

Blanch: Water-blanch preferred.
Water-blanch: 90 sec.
Steam-blanch: 2 min.

Chill: In running cold water for several minutes.

Package: A, B, C, and D types recommended.

The following rhubarb pie is one of the best tasting pies ever put in your mouth: Prepare dough for two-crust, 9-inch pie. Spread contents of quart of frozen rhubarb over bottom crust, over which pour a mixture made by mixing 4 tbsp. flour with 2 cups sugar and adding 2 eggs (beat mixture well). Arrange top crust and bake in moderate oven (350° F.) for one hour.

RUTABAGAS

Prepare: Cut off tops; peel, dice in 1/2-inch cubes.

Blanch: Steam-blanch preferred.
Steam-blanch: 70 sec.
Water-blanch: 60 sec.

Chill: In running cold water for about 3 minutes.

Package: A, B, C, and D types recommended.

Rutabagas may be tossed with buttered bread crumbs and fried; they may be scalloped using tomato sauce and grated cheese for flavoring; or they may be mashed, mixed with the following ingredients, and baked: 3 cups rutabagas; 3 tbsp. butter; salt and pepper to taste; 1 tbsp. sugar; 1 egg, beaten; milk to make them fluffy. These are all delicious ways of serving this vegetable.

SPINACH

Prepare: Wash thoroughly in running cold water to eliminate all particles of grit and soil. Cut off and discard thick main stems.

Blanch: Water-blanch preferred; agitate basket during blanching period.

Water-blanch: 2 1/2 min.
Steam-blanch: 3 1/2 min.

Chill: Thoroughly in running cold water for at least 3 minutes.

Package: A, B, C, and D types recommended.

This is one of the vegetables that freezes almost perfectly; it can be served in any of the ways the fresh product is cooked and served. Here is one unusual way to glorify and serve it: To pastry dough add 1/4 cup chopped, crisp bacon mixed in while making; bake pastry in tart shells (over backs of muffin pans); fill tarts with cooked, minced spinach creamed with a rich white sauce and seasoned with grated cheese, salt and pepper to taste.

SQUASH, SUMMER

Prepare: Wash in running cold water; slice in 1/2-inch slices.

Blanch: Water-blanch preferred.

Water-blanch: 3 1/2 min.
Steam-blanch: 4 1/2 min.

Chill: In running cold water for about 5 minutes.

Package: B, C, D, and G type recommended.

For a tempting casserole dish, combine summer squash with kernel corn and green beans, cover with thin white sauce, season with onion or garlic and parsley, top with buttered bread crumbs, and bake.

SQUASH, WINTER

Prepare: Peel the squash, then cut in 1-inch cubes.

Blanch: Cook until tender in either steam or boiling water, although steam is preferred. When cooked, mash.

Chill: Cool quickly by floating pan in running cold water.

Package: B, C, and D types recommended.

You've heard of sweet potato pie—well—why not squash pie, too? Mix together 1 pt. pkg. thawed frozen squash, 2 eggs slightly beaten, 1/2 cup coconut, 1/2 cup sugar, 1 tbsp. butter melted, 1/4 tsp. cinnamon, 1/8 tsp. nutmeg, 1/4 tsp. lemon extract, 1 tsp. vanilla, pinch of salt; to this, gradually add 1 1/2 cup milk; pour in pastry-lined, 9-inch pie plate; sprinkle 1/2 cup coconut over top 10 min. before baking is completed; bake in hot oven (450° F.) for 20 min., reduce heat (350° F.) and bake 20 min. longer.

SWISS CHARD

Prepare: Wash thoroughly in running cold water to rid leaves of gritty soil and foreign particles; cut off and discard main stems.

Blanch: Water-blanch preferred; agitate basket during blanching period.

Water-blanch: 2 min.
Steam-blanch: 3 min.

Chill: In running cold water for about 5 minutes.

Package: A, B, C, and D types recommended.

This vegetable is finding increasing favor among those who like

greens; try serving it cooked and seasoned with sautéed onion, tarragon vinegar, or French dressing.

TOMATOES

Prepare: Select uniformly red, fully ripe fruit; wash.

Blanch: Either boiling water or steam is satisfactory.
Steam-blanch: 2 min.
Water-blanch: 2 min.

Chill: In running cold water for 5 minutes. Then peel, cut out and discard blossom ends and cores. Package in containers recommended for fruits.

Package: A, B, C, and D types recommended.

While tomatoes will produce a satisfactory frozen product, they are not better than the canned product; if freezer space is limited, it is recommended that tomatoes be canned and freezer used for those vegetables which are preserved better by freezing.

TURNIPS

Prepare: Cut off tops; wash in running cold water; peel, and dice in $^1/_2$-inch cubes.

Blanch: Steam-blanch preferred.
Steam-blanch: 70 sec.
Water-blanch: 60 sec.

Chill: Thoroughly in running cold water for 5 minutes.

Package: A, B, C, and D types recommended.

The flavor of turnips, parsnips, and rutabagas seems to improve with freezing; the flavor is milder. Turnips may be prepared in any of the suggested ways given for parsnips and rutabagas.

TURNIP GREENS

Prepare: Wash thoroughly in running cold water, eliminating all coarse large leaves.

Blanch: Water-blanch is preferred; agitate basket during blanching period.
Water-blanch: 60 sec.
Steam-blanch: 100 sec.

Chill: In running cold water for 5 minutes.

Package: A, B, C, and D types recommended.

There are *seven* different kinds of greens, each having its own distinctive flavor, so it should be no trouble tempting your family to eat them when prepared and served appetizingly. Try freezing turnip greens—the popular vegetable in the south; they may be a welcome change from the greens usually served.

Fruits

The equipment needed for freezing fruits is the ordinary kitchen wares plus an ample amount of ice and, of course, proper packaging materials:

1. Sharp knives for capping berries, pitting fruit, etc.
2. The necessary bowls or pans in which to wash and prepare them.
3. Ice for keeping fruit chilled while working with it, especially berries and cherries. When washing fruit add ice to the water, for warm, ripe fruit is likely to become mushy while it is being prepared for the freezing containers. Extremely cold water "firms" fruit; warm water causes it to become water-logged and to bleed.
4. Packaging materials. It is essential that packages containing fruits be water-tight, otherwise the liquid from the fruit may seep through the container causing a good deal of trouble in the freezer. For peaches, apricots, and other fruits which brown readily, packaging must be absolutely moisture-vaporproof as well as water-tight. Recommended containers are shown in the illustration facing page 128.
5. Electric hand iron, curling iron, or heat-sealing iron for heat-sealing containers where necessary. Many of the containers for packaging

fruits need no heat-seal for they are made with snap-in and snap-on lids or metal lids which are easily put in place and provide an adequate seal (such as the Vapocan made by the Container Corporation of America).

6. China-marking pencil or soft crayon for labeling packages with contents, date packed, and name or locker number if packages are to be taken to a locker plant for freezing or storage.

How to Use Sugar or Prepared Syrup

Whether you use dry sugar in preparing fruits for freezing, or a prepared syrup, one of the objects for good fruit preservation is to cover the fruit with juice or syrup so as to keep it from being exposed to the air which would cause an undesirable darkening (oxidation). So it is important that when syrup is used, a sufficient quantity is poured over the fruit to cover it; and, when dry sugar is used that the sugar be stirred in with the fruit until it has almost dissolved and drawn sufficient juice from the fruit to cover it.

The sugar treatment simply consists of adding dry sugar in the correct proportions to the whole or sliced fruit, then stirring until most of the sugar has dissolved in the juice drawn from the fruit; then pour fruit into containers.

The syrup treatment consists of packing sliced or whole fruit in freezing containers and then covering it with simple sugar syrup made in advance and cooled before using. The syrup may be made either by dissolving sugar in boiling water, or mixing Sweetose White syrup with water in the proportions given in the tables on the next page.

Honey may also be used as sweetening when preparing

fruits for freezing. It can replace part of the required amount of sugar or corn syrup. But be sure the honey is mild in flavor and light in color otherwise honey flavor will predominate over the fruit flavor.

When Using Sugar to Make Syrup

Concentration Desired	Cups of Sugar Needed per Pint of Hot Water
30%	1
40%	1⅔
50%	2½
60%	3½
65%	4½
70%	5½

When Using Sweetose to Make Syrup

Concentration Desired	Water Needed for Each 5-Lb. Jar Corn Syrup
50%	2 Pts., 1 Cup
60%	1 Pt.
65%	1 Cup
70%	½ Cup

In this chapter, two syrup concentrations are given for the syrups to be used on fruit, the lower for granulated sugar syrup, the higher for Sweetose syrup.

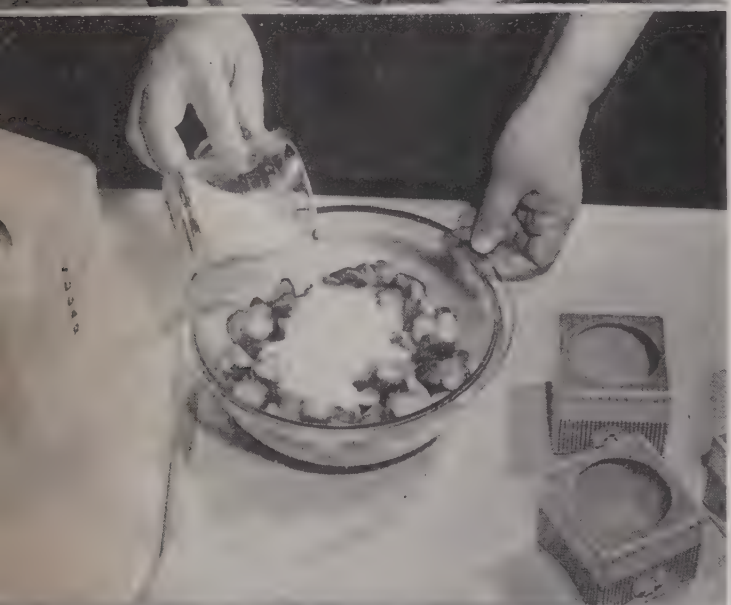
When to Use Sugar or Syrup

A general rule to follow in the sugar vs. syrup treatment of fruits is to use syrup on those fruits which have comparatively little juice—sugar on those fruits which have plenty of juice which can be drawn from the fruit to form a natural sugar syrup. When using dry sugar, always slice or slightly crush the fruit so the juice can be readily withdrawn. Whenever whole fruit is to be frozen, it is best to use the prepared syrup.

Of course there are exceptions to this rule and the two best examples are sliced apples and whole cranberries. Cranberries require no sugar or syrup and may simply be

ypes of packaging for freezing fruits: A. Waxed end-opening folding carton with heat-sealing bag-liner; . Waxed top-opening folding carton with moistureproof Cellophane liner; C. Heavily waxed Lily Tulip ozen food container; D. Heavily waxed heat-sealing Dacca container; E. Heavily waxed Vapocan with etal slip-in lid; H. Sealright ice cream carton; when fitted with moistureproof liner, is suited for use in packaging fruits.

When cleaning delicate fruit such as strawberries or raspberries, use a quantity of ice in the water to help keep the fruit firm, to keep it from becoming mushy or water-logged as may happen with warm water.



When freezing fruits with sugar, add sugar in the correct proportion to the sliced or slightly crushed fruit in a bowl. Gently stir fruit with sugar until sugar is partially dissolved in juice drawn from fruit. Work with small quantities at a time.

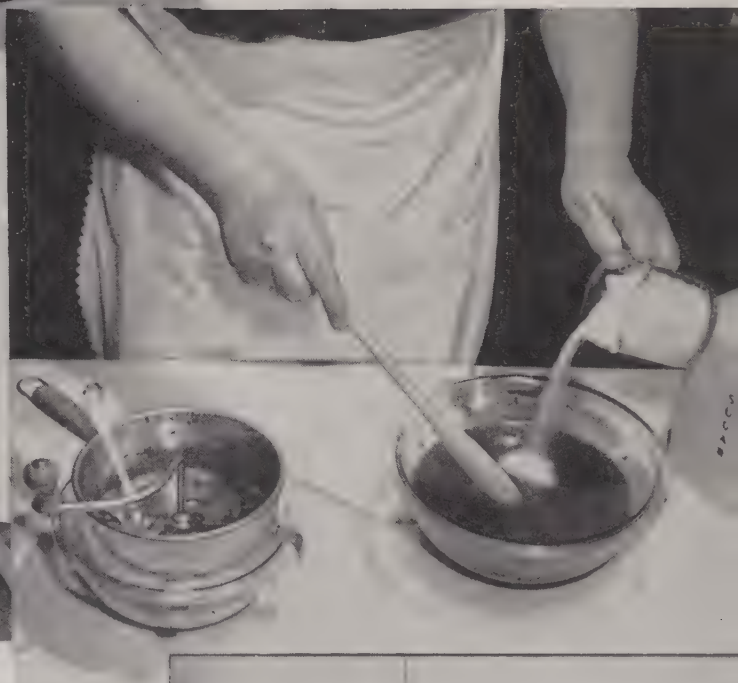
All liquid and semi-liquid products expand during freezing, so space in container must be allowed for this increase in bulk. When packaging fruits, fill container only to within three-fourths to one inch of top.

After being washed, peeled, etc., fruit to be frozen with syrup is packed into containers, then covered with syrup. Sometimes fruit may be cut directly into containers as demonstrated here with grapefruit sections.

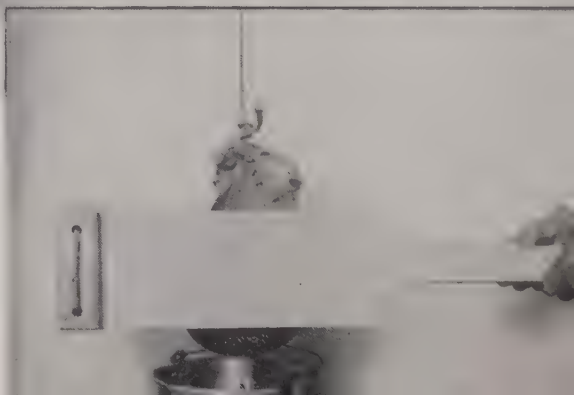
Make freezing syrup in advance and chill in refrigerator before pouring it over fruits. Use enough syrup to just cover fruit. If fruit floats in syrup, a piece of crushed moisture-proof paper placed in air space under lid of container will keep fruit submerged.

Apples are prepared by blanching them, as one does a vegetable. Work with small quantities of this fruit to prevent discoloration (oxidation). Hold peeled apples in a weak salt brine solution prior to blanching.

Efficient puréeing equipment may be procured for use in making pulpy fruit juices for frozen purées as described on pages 144–145. Pictured at left is puréeing attachment which can be fitted to Mixmaster electric mixer. Below is pictured hand operated Foley Food Mill. Such puréeing equipment easily removes skins and seeds, leaving only pulpy juice. The juice is then mixed with correct proportion of sugar or Sweetose White syrup, packaged and frozen, to be used later for ice cream sundaes and other dessert dishes.



Above is a hand operated hydraulic press and at right is pictured the "nut-cracker" type of hand press which may be used to extract juices from vegetables and fruit. After juice is extracted, it may be packaged and frozen (see directions, pages 140–143). *Photographs courtesy New York State Agricultural Experiment Station.*



washed and packaged dry. Apples are pared, sliced, and then given either a water- or steam-blanching treatment (like vegetables), or treated with a sulfite solution and packaged dry.

Blueberries may also be frozen without sugar or syrup, but the frozen product is better if the blueberries are slightly crushed and mixed with a small amount of sugar.

If you should happen to run short of sugar when freezing fruits and are unable to get enough for immediate use, and fruits must be frozen to save them, you can cut down on the amount of sugar used with such fruits as raspberries, loganberries, Boysenberries, Youngberries, dewberries, gooseberries, or currants. The amount can safely be cut to about one-half, using 8 parts of these fruits to 1 part of sugar (they are usually frozen with 4 or 5 parts of fruit to 1 part of sugar). When scant amounts of sugar are used for freezing fruits, you will find the frozen product more suitable for making pies, jams, or jellies than for dessert purposes.

While there are some fruits which are never recommended for freezing with dry sugar (such as peaches, plums, and apricots which have very little juice), there are a number of fruits which may be frozen with either sugar or syrup. Raspberries and strawberries are two notable examples; blueberries, blackberries, loganberries, dewberries, Youngberries, and Boysenberries are others. The whole berry is frozen with the syrup; the slightly crushed berry with the sugar.

The liquid on fruits will expand during freezing, so be sure to allow for this increase in bulk when packaging fruits, giving each package from three-fourths to one-inch headroom. Less headroom will be needed for pint packages than for quart packages. If headroom is not allowed on liquid or semi-liquid products for freezing, the

covers will be pushed up, breaking the seal, or the packages will burst, causing a good deal of trouble in the freezer.

To Prevent Fruit Browning

When peaches, apples, plums, apricots, pears, and cherries are cut and exposed to the air, the cut surfaces will become very discolored if allowed to stand for any length of time. In some cases, it may even take place slowly during frozen storage; and if the thawed fruit is not served immediately, it will discolor very rapidly. Since discoloration not only affects the attractive appearance of fruit, but changes the flavor as well, you may find it advisable to treat the above-named fruits with ascorbic acid. Ascorbic acid is another name for vitamin C; it can be purchased at some—not all—drug stores in powdered form. Besides being rather hard to get, it is also rather expensive, but it certainly will prevent discoloration of any cut fruit you freeze—the only sure way that has been found up to now of doing this. The ascorbic acid is added to the syrup before it is poured over the fruit in the freezing containers. Use 1 teaspoon of ascorbic acid powder to 4 cups of prepared syrup, this amount being sufficient to treat about 12 pint packages of fruit.

APPLES

Procedure 1: Blanching Treatment—Select firm winter apples. Peel, core, then slice in twelfths. Work with a small amount at a time to prevent the apples being exposed to the air for too long a time. After slicing, hold them in a weak salt brine (2 tbsp. in gallon water) until they are ready to be blanched. Steam-blanch (recommended) for 90 seconds; water-blanch for 60 seconds and then cool in running cold water (or water containing ice). Package dry without sugar or syrup.

Procedure 2: Sulfite Treatment—Select firm winter apples. Peel, core, then slice in twelfths, dropping slices into a weak brine (2 tbsp.

salt in gallon water). After 15 or 20 apples have been sliced, remove slices from salt brine and place them in a freshly prepared sulfite solution for 5 minutes. The sulfite solution is prepared by dissolving 2 tsp. of *sodium sulfite* or *sodium bisulfite* (either the U. S. P. or C. P. grade will do) in 1 gallon of water. An earthenware, stainless steel, glass or enameled container must be used for the sulfite solution. The same solution may be used to treat 4 or 5 lots of apples. The slices tend to float in the sulfite solution, so place a pyrex or china plate on top of the slices to keep them immersed. After 5 minutes in the sulfite solution, remove the slices to an earthenware, china, or glass bowl and hold them in the refrigerator for 4 or 5 hours before packaging. Package dry using no sugar or syrup.

Procedure 3: Apple Sauce—Prepare apple sauce in the usual manner, sweetening to taste (about $^1/_2$ to $^3/_4$ cup sugar per 5 cups apple sauce). If spiced apple sauce is made with lemon juice or peel, cinnamon, nutmeg, or cloves, add slightly more of the spices than usual as spices seem to lose some of their potency during frozen storage. Cool the cooked apple sauce before packaging.

Package: A, B, C, and D types recommended for slices: A, B, C, D, and E types for sauce.

If fresh apple pie is a favorite at your house, you will probably want to include apples on your list of fruits for freezing on two counts: frozen apples make every bit as delicious pie as the fresh ones; and you can't get good apples for pie making all year round.

APRICOTS

Procedure: Halves or Whole—Apricots may be frozen with or without skins; to peel, immerse fruit in boiling water for 15 to 30 seconds, then in running cold water for a minute or two, and rub off peels. If they are frozen with skins, wash in cold running water, then halve and pit, or leave whole for freezing. Pack into container; cover with 60 or 70% syrup, allowing $^3/_4$ inch headroom.

Package: A, C, D, and E types recommended.

Try topping apricot pies lattice fashion with cream cheese (softened and mixed with cream or top milk) run through a pastry tube. Apricots also bolster the flavor of peaches and can be combined with them either before freezing, or mixed together afterwards for dessert and pie purposes.

AVOCADOS

Serve avocados as a dessert: Cut 2 avocados in half, remove pit; scrape out pulp from rind, keeping rind intact; mash pulp and mix well with 4 tsp. lemon juice and 3 tbsp. sugar; put pulp back into rind halves, freeze. When frozen, wrap halves in moisture-proof paper, pack in deep folding waxed carton, then over-wrap carton with moistureproof paper and heat-seal. To serve, allow to stand in the package until thawed, serve while still chilled.

BLACKBERRIES

Procedure: Select fully ripe berries; wash thoroughly in cold running water or, preferably, in water containing ice. Clean, eliminate red and green berries. Fill container to within $^3/_4$ inch of top to allow for expansion during freezing; cover with 50 or 60% syrup.

Package: A, C, D, and E types recommended.

Not a particularly good product to serve as a dessert sauce, but makes delicious pies, excellent jellies, good wine.

BLUEBERRIES

Procedure 1: Wash fully ripe berries in cold running water or, preferably, in water containing ice. Then pick out stems, pieces of leaves and green berries. Mix with dry sugar in the proportion of 5 or 6 pounds fruit to 1 pound sugar. Stir gently until juice is drawn from berries and sugar is partly dissolved in juice. Fill container with berries, allowing $^3/_4$ inch headroom.

Procedure 2: Wash in cold running water or, preferably, in water containing ice; pick out stems and leaves; eliminate bruised berries. Fill container or carton *full;* use no sugar or syrup. Since berries are packed dry, no headroom need be allowed.

Package: A, C, D, and E types recommended; the B type may also be used for the dry pack.

Muffins, upside-down cake, waffles, and pancakes are just some of the foods made better by using frozen blueberries in your favorite recipes; makes delicious pies, too, and can be served as a dessert sauce with cream.

BOYSENBERRIES

Treated same as Blackberries.

Serve this fruit as a dessert sauce, or freeze the pulpy juice or purée (see pp. 143–145) for use in making Velva Fruit (p. 197) or as a topping for ice cream sundaes.

CANTALOUPE

Procedure: Select fully ripe, vine-ripened cantaloupe. Cut in half; scrape out seeds; cut into slices, peel off rind and hard flesh; cut soft flesh into $^1/_2$- to $^3/_4$-inch cubes. Mix with sugar, using 1 pound of sugar for each 5 pounds cantaloupe; stir until sugar is partially dissolved. Pack in containers, allowing headroom for expansion.

Package: A, C, D, and E types recommended.

A few packages of frozen cantaloupe are very nice in the freezer for fruit cup, for salads, and for flavoring ice creams by adding the puréed product to ice cream mixture as it goes into the freezer.

CHERRIES, SOUR and SUB-ACID

Procedure: Select fully ripe cherries; wash in water containing ice; stem and pit. Add 1 pound sugar to each 4 or 5 pounds cherries; stir gently until sugar is partly dissolved in juice drawn from cherries. Fill containers to within $^3/_4$ inch of top to allow for expansion during freezing.

Package: A, C, D, and E types recommended.

English Morello and Montmorency cherries make very delicious red pies; but you will enjoy serving and eating cherries in many other ways too: tarts, shortcake, deep dish pie, as jelly and jam, and also as simple fruit dessert when they are frozen with a lot of sugar.

CHERRIES, SWEET

Procedure: Use fully ripe fruit; wash in water containing ice; stem. Pack in container for freezing, allowing $^3/_4$ inch headroom for expansion; cover with 40 or 50% syrup.

Package: A, C, D, and E types recommended.

While the frozen sweet cherries do not compare with the frozen sour cherries, they do make a satisfactory fruit to serve as a dessert or to use in upside-down cake, etc.

CRANBERRIES

Procedure 1: Wash in cold running water; pick out stems, pieces of leaves, and poor berries. Pack dry, without sugar or syrup, in any container or carton recommended for fruits or vegetables.

Procedure 2: Wash berries in cold running water; pick out stems, pieces of leaves, and poor berries. Cook berries as you would for cranberry sauce, or purée (strain), adding sugar to taste. Fill container allowing 3/4 inch headroom.

Package: A, B, C, D, and E types may be used for the dry pack; A, C, D, and E types recommended for sauce.

Cranberry orange relish may also be frozen as well as the fresh cranberries or the prepared sauce. To make cranberry orange relish use oranges in the proportion of 1 large orange to 2 cups cranberries; put cranberries, the orange rind and also the pulp through the food chopper, grinding medium-fine; add 3/4 cup sugar to each 2 cups pulp and mix thoroughly; pack in freezing containers, allowing headroom for expansion during freezing.

CURRANTS

Procedure: Select soft-ripe fruit; wash in cold running water or, preferably, in water containing ice; stem. Add 1 pound sugar for each 3 pounds fruit; stir gently until enough juice is drawn from fruit to partly dissolve sugar. Fill container to within 3/4 inch from top for headroom.

Package: A, C, D, and E types recommended.

Serve occasionally as a substitute for cranberry sauce; for this purpose freeze with smaller amount of sugar (1 lb. sugar for each 4 lbs. fruit). Delicious also for pies and upside-down cakes. Fine for jelly making.

DEWBERRIES

Treated same as BLACKBERRIES.

If you don't like the seeds in these berries, freeze these fruits as a pulpy juice, containing all of the berry except the seeds. These pulpy juices, or purées are exceptionally fine as toppings for ice cream sundaes. Dewberries also make very good pies and upside-down cakes.

FIGS

Procedure: Wash in water containing ice; eliminate under-mature fruit. Pack in container, allowing 3/4 inch headroom; cover with 50 or 60% syrup.

Package: A, C, D, and E types recommended.

If you live in a section where figs are grown, or quantities are available at reasonable prices in season, you will want to freeze some for year-round eating pleasure.

GOOSEBERRIES

Procedure: Pick off stems and blossom ends; wash in cold running water. Crush slightly; add 1 pound sugar for each 3 pounds berries; gently stir until juice is drawn from the berries to dissolve sugar partly. Fill container to within $^3/_4$ inch from top.

Package: A, C, D, and E types recommended.

The lowly gooseberry is generally thought of as being too sour. This discreditable reputation is due mostly to the fact that for most preserving purposes the gooseberry is picked and used when it is still green. Dead ripe gooseberries, tinged with red and purple, are sweet—altogether different than the sour green ones. Let your gooseberries ripen on the bush, then freeze some for pies that will get calls for repeat performances.

GRAPEFRUIT

Procedure: Select soft-ripe fruit. To loosen peels, immerse for 3 minutes in boiling water, then cool in cold running water; peel, remove all white membrane; break into sections; remove section membrane and seeds. Pack in container, allowing $^3/_4$ inch headroom; cover with 60 or 70% syrup.

Package: A, B, C, D, and E types recommended.

Comment: Under certain conditions grapefruit may change flavor during storage so it is wise to hold it only for a relatively short storage period.

It is difficult to get good breakfast grapefruit the year round and if you like grapefruit sections swimming in juice, be sure to freeze some of this product when the best grapefruit are on the market, or when they are fully tree-ripened if you live in a citrus fruit belt. Can be used for salads and fruit cocktails, too. Try adding a bit of mint flavor to the grapefruit when serving it.

LOGANBERRIES

Treated same as BLACKBERRIES.

This is one of the fruits that make delicious ice cream (see p. 196), or the fruit can be puréed and used as a topping for plain vanilla ice cream. May also be served as a fruit sauce.

MIXED FRUITS

Procedure: Select soft-ripe fruit. Peel, core, pit, slice, or cube as given in directions for each individual fruit. Pack in container allowing 3/4 inch headroom; cover with 60 or 70% syrup.

Suggested Combinations: 1 1/2 cups pineapple; 1 cup apples; 1 1/2 cups cantaloupe; 3/4 cup Boysenberries or Youngberries; and 1/4 cup Maraschino cherries.

1 1/2 cups apricots; 1 1/2 cups Boysenberries or Youngberries; 1 cup red raspberries; 1 cup pineapple.

Equal portions of sliced peaches and red raspberries; or equal portions of sliced peaches and sliced strawberries.

Equal portions of pineapple, rhubarb, and strawberries.

Equal portions of apricots, pineapple, and cherries.

NOTE: Since berries and rhubarb are in season earlier than such fruits as peaches and apricots, the frozen product will have to be used for those fruits out of season to make some of the suggested mixed fruit combinations. Simply thaw the fruit enough so that the individual pieces can be broken apart, and use it to mix with the fresh fruit in such cases.

Package: A, C, D, and E types recommended.

Frozen mixed fruit ready to serve as fruit cocktails, salads, or compote is mighty handy in the freezer. If you wish to experiment with your own mixtures, give thought to color combinations as well as flavor. Sometimes two fruits combine as nicely as three or four.

MUSKMELON

See CANTALOUPE.

NECTARBERRIES

Treated same as BLACKBERRIES.

This is a new member of the blackberry family and very tasty. Can be used in any of the ways blackberries, dewberries, loganberries, Boysenberries, or Youngberries are used.

NECTARINES

Treated same as PEACHES.

The pulpy juice of nectarines makes a wonderful sundae sauce, so you may wish to freeze some of this product (see p. 143). Nectarines also have more flavor than peaches, and when making a peach pie or shortcake, the flavor is enhanced if 1 package of peaches is used together with 1 package of nectarines.

OLIVES

Procedure: Pick olives ripe; pickle in the usual manner. After product has been pickled, pack olives in container, allowing ¾ inch headroom; cover with the liquid brine. They may also be frozen dry, without brine; in this case fill container full.

Package: A, C, D, and E types recommended.

The flavor of olives frozen promptly after pickling is especially fine. However, when this product is thawed, it should be used within a very few days, as it is perishable at room temperature; be sure to keep this product under refrigeration after it is thawed until it is used.

ORANGES

Procedure: Select soft-ripe fruit. To loosen peels, immerse in boiling water for 2 minutes, then cool in cold running water. Peel; break into sections, removing membranes and seeds; pack in container, allowing ¾ inch headroom; cover with 60 or 70% syrup.

Package: A, C, D, and E types recommended.

Oranges, grapefruit, and pineapple make a nice tropical fruit cocktail which you can serve when you have these frozen fruits on hand. Orange sections make a nice breakfast dish too, as a change from juice or slices.

PASSION-FRUIT

This makes one of the most delicious fruit purées of any of the long list of fruits. The purée can be used to make either passion-fruit ice cream, or Velva Fruit (see pp. 196–197).

PEACHES

Procedure: Select soft-ripe fruit. To remove skins, immerse peaches in boiling water for about a minute, then in cold running

water and skins will rub off. Cut out bruised or imperfect portions. Peaches may be frozen in halves, or sliced. For halves, remove pit and pack in container, allowing headroom; for slices, slice sections from around pit directly into container, allowing headroom for expansion. Cover peaches with 60 or 70% syrup.

Package: C and D types recommended for halves; A, C, D, and E types for slices.

Upside-down cake, pie, shortcake, and just as a plain fruit sauce are some of the many ways this fruit may be used. The puréed peaches also make excellent ice cream, or topping for sundaes.

PEARS

Procedure: Select soft-ripe fruit; wash in cold running water. Peel, cutting out bruised or imperfect portions; core and quarter; slice or dice, if desired. Pack in container allowing ¾ inch headroom; cover with 60 or 70% syrup.

Package: A, C, D, and E types recommended.

Pears do not make a particularly desirable frozen product, but directions are here given for those who wish to freeze them.

PERSIMMONS

Like passion-fruit, persimmons are very good made into a purée and frozen for use in making ice cream, or as a topping for plain vanilla ice cream.

PINEAPPLES

Procedure: Select soft-ripe fruit. Peel; remove core; then slice, dice, cut in wedges or sticks. Pack in container allowing ¾ inch headroom; cover with 60 or 70% syrup.

Package: A, C, D, and E types recommended for dice or wedges; C type for slices; D type for sticks.

Comment: Under certain conditions pineapple may change flavor during storage so it is wise to hold it only for a relatively short storage period.

Oftentimes we overlook the fact that a slightly tart fruit served plain, ends a heavy meal in a most satisfactory way. Pineapple served this way in an attractive setting tastes mighty good—especially when fresh pineapple has been out of season for months.

PLUMS AND FRESH PRUNES

Procedure: Select soft-ripe fruit; wash in cold running water; pit and quarter, or cut in halves. Pack in container allowing 3/4 inch headroom; cover with 60 or 70% syrup.

Package: A, C, and D types recommended.

Frozen plums or fresh prunes make as nice a pie as cherry and will get as many calls for repeat performances. The fresh plum or prune pie most restaurants serve these days is made from the frozen fruit; you will notice, too, it is usually the restaurant's dessert "feature" for the day.

POMEGRANATE

Procedure: Select fully ripe fruit; peel and remove seeds. Pack in container, allowing 3/4 inch headroom; cover with 40 or 50% syrup.

Package: A, C, D, and E types recommended.

This fruit is not interesting to serve by itself, but certainly does add attraction to any assortment of mixed fruits you may care to serve.

RASPBERRIES, BLACK, PURPLE, RED

Procedure 1: Select soft-ripe fruit. Clean berries by washing them in water containing ice; eliminate berries which are immature, moldy, etc. Add 1 pound sugar to each 4 or 5 pounds of berries; stir gently until sugar is partly dissolved in juice drawn from berries. Fill container, allowing 3/4 inch headroom.

Procedure 2: Clean berries as described above, eliminating immature berries and those which are soft and mushy. Pack whole berries in container, allowing 3/4 inch for headroom; cover with 50 or 65% syrup.

Package: A, C, D, and E types recommended.

When black raspberry ice cream first appeared on the market it swept the country by storm by virtue of its goodness. If you freeze some of your raspberries in a purée (p. 144) you, too, can make the same mouth-melting product right at home. Raspberries are one of frozen foods' real delicacies and besides using them for pies, shortcakes, etc., don't overlook serving them simply as a dessert sauce too.

RHUBARB

Listed under and treated as a vegetable (page 122).

STRAWBERRIES

Procedure 1: Select soft-ripe fruit; wash berries in water containing ice. Hull; slice in 3/8-inch slices; add 1 pound sugar for each 4 or 5 pounds berries; stir gently until sugar is partly dissolved in juice drawn from berries. Pour into container, allowing 3/4 inch headroom.

Procedure 2: Select soft-ripe fruit; wash berries in water containing ice. Hull, eliminating those berries which are either green or decayed. Pack into container, allowing 3/4 inch headroom; cover with 50 or 65% syrup.

Package: A, C, D, and E types recommended.

Comment: Preferably, strawberries should be frozen sliced with sugar, since this method retains flavor better.

One's imagination can almost run wild in thinking about ways to serve this toothsome frozen fruit, for there will always be something special about serving strawberries in January with all the garden goodness of June whether you serve them as a plain fruit sauce, in pies, shortcakes, or myriad other ways.

YOUNGBERRIES

Treated same as BLACKBERRIES.

Of the blackberry family, Youngberries are more flavorful than many. They make very good ice cream or Velva Fruit (see p. 197); they can be served as a fruit sauce, in pies, upside-down cake, tarts; etc.

WATERMELON

Does not produce a satisfactory frozen product except as a purée (see p. 144). As such it gives a real exotic touch to ice cream, puddings, etc.

FRUIT AND VEGETABLE JUICES

A number of very fine-tasting fruit and vegetable juices can be made and frozen; and you can find many occasions to serve them: as the first course at mealtime, in mixed fruit drinks or cocktails, in punches. But it doesn't seem advisable to freeze a quantity of juices at the expense of having to omit some of the more essential foods

because of lack of freezer space. But if your freezer is ample in size, you may wish to freeze some fruit juices, especially the more unusual ones which cannot be purchased commercially.

There is considerable work getting the juice extracted from some fruits and almost all vegetables, even though the freezing procedure thereafter is simplicity itself. So it is doubtful whether many women would freeze tomato or prune juice, for example, when it can be purchased so very reasonably from the grocer. However, some families prefer the flavor of their home-made juices and they probably have more tomatoes or apples than they know what to do with anyway. These families would profit considerably by freezing their juices instead of canning them, for there is less work involved and you get a very fine, true juice flavor.

Apples and pears may be taken to a cider mill for juicing if one is in the vicinity. But all other juices must be prepared at home which limit the kinds of fruit juices you can freeze to those soft fruits where juice is easily extracted unless you have juicing equipment. These fruits for juicing include grapes, cherries, raspberries, grapefruit, and oranges. Of course, grapefruit and orange juice may be reamed by the juicer you ordinarily use for these fruits.

In juicing fruits or vegetables, use aluminum, stainless steel, or glass containers for the juice. Do not allow the fruit juices to stand around for any length of time for contact with the air causes them to lose flavor and develop off-flavors.

It is advisable to cut up, grind, or crush the fruit or vegetable before the juice is extracted, since a much larger yield of juice is obtained. Grapes and rhubarb are heated before pressing to extract color and a larger quantity of

juice than would otherwise be had. Crush grapes and heat them in the top of a double boiler to 140–145° F. Cut rhubarb in pieces 4 to 6 inches long, add 2 quarts water for each 10 pounds rhubarb, and just bring to a boil.

If only small quantities of nearly clear fruit juices are desired, they can be made by pressing the hot crushed fruit in a strong jelly bag. The suspended bag, in which has been placed the crushed fruit, may be pressed with the hands, or a home-made hand press of the "nutcracker" type may be used to facilitate pressing. The "nutcracker" type of press may be made from two large wooden paddles (see photo facing page 129), using a rope of small diameter as the hinge. This rope should be long enough so that it may be adjusted to fit the bulk of the bag. Cherry, raspberry, nectarberry, blackberry, elderberry, dewberry, Youngberry, Boysenberry, loganberry, grape, currant, and rhubarb juices may be made by pressing the hot fruit in such a bag (like juices for jelly making are extracted). Large quantities of these fruits should be pressed in a small hydraulic or barrel press (see photo).

Tomato juice is made by first washing fully ripe tomatoes, then trimming to eliminate green, yellow, and black areas and cores. The trimmed tomatoes are quartered, then placed in a large pan, then water (not more than a cup) is added, and the tomatoes heated to boiling. The juice is then extracted by pressing through a sieve, colander, tapered screw press, or Foley Food Mill.

Once juice is extracted and has been cooled, all that is necessary to freeze it is to pour it into water-tight containers, allowing headroom for expansion during freezing, and heat-seal containers, where heat-sealing is needed. Most juices are frozen without the addition of sugar, although they may be sweetened to taste if desired.

Since frozen grape juice deposits cream of tartar crystals, it should be thawed in an electric refrigerator, then, without warming, strained through a muslin jelly bag and again packaged and frozen.

Apple and rhubarb juices can be combined with other fruit juices for very tasty juice blends. Combine apple with berry, cherry, plum, or cranberry; combine rhubarb with grape or cherry.

Purées, or Pulpy Fruit and Vegetable Juices

Purées or pulpy fruit juices have a host of uses. They are easy to make; and they emerge from the freezer in excellent condition.

Vegetable Purées—To freeze vegetable purée, merely cook the vegetable in boiling water or steam until it is done; then mash it with a potato masher, mashing it smooth without whipping air into it. A kitchen utensil made especially for puréeing foods such as the Foley Food Mill (see photo facing page 129) makes this an easier task and produces a fine purée. Pack the purée into any container such as is used for fruits, heat-seal if necessary, label, and freeze.

Purées make excellent cream soups, or they can supply baby with his quota of vegetables until he is able to partake of more solid foods, or they will aid materially in the diet of the sick.

To serve them as a vegetable, merely thaw the purée in the package, then season and heat to serving temperature. To serve as a cream soup, add one-half cup of milk or water to a pint package of purée, season to taste, and heat to serving temperature, stirring occasionally.

Those vegetables which make the best puréed products for freezing are the following: asparagus, peas, spinach,

carrots, beets, parsnips, rutabagas, turnips, sweet potatoes, pumpkin, winter squash.

Fruit Purées—Crushed and puréed fruit has a definite mission in your freezer as wonderful flavor for ice cream bases, for topping for ice cream you store in your freezer, for shortcakes and cobblers, and for sauces and puddings.

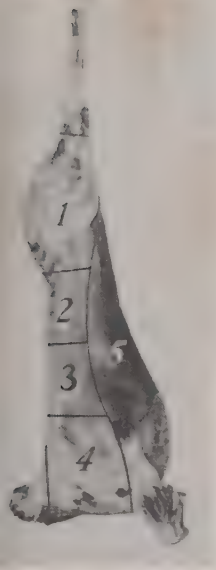
Some fruits may be converted into purées simply by washing, cleaning and then putting through suitable puréeing equipment, e.g., a Sep-Ro-Siv, a Mixmaster purée attachment or a Foley Food Mill. Fruits which may be handled in this simple way include raspberries (red, black and purple), dewberries of various kinds including Boysenberries, Youngberries, loganberries and nectarberries, blackberries, blueberries and chopped-up pineapple. The resulting purées may be sweetened, preferably by adding one cup of Sweetose White syrup or two-thirds cup of granulated sugar for each cup of purée and stirring well. The product is packaged in paperboard cartons or other containers and frozen. Three-fourths-inch headroom must be left to permit expansion.

The seeds of strawberries are so small that they need not be removed. These berries may be prepared by putting through a food chopper, then mixing with sugar or Sweetose White syrup, packaging and freezing.

Peach, plum and apricot purées darken quickly if the fruit is not heated. For this reason these fruits should be quartered, pitted and then heated just to the boiling point, adding only enough water to keep the fruit from burning. The fruit should be allowed to cool and then put through a puréeing device. The purée is then mixed with sugar or Sweetose White syrup (as directed above), packaged and frozen.

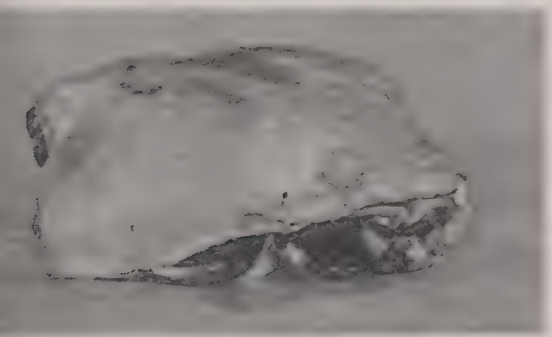
Use aluminum, stainless steel, or glass containers when working with the fruit purées, as fruit acid will affect tin,

LAMB



(Left) Trim legs (1); shoulders (4) into roasts; cut ribs (3), loin (2) into chops; bone breast (5), shanks, neck, for stew or ground lamb.

(Above) First make cross-carcass cuts to give: A five-rib shoulder (a) leaving other ribs on rack (b); loin (c); and leg (d).



Bone shoulder to give compact roast. Where there is a large proportion of bone in a piece of meat, it is advisable to remove the bone and roll or tie.

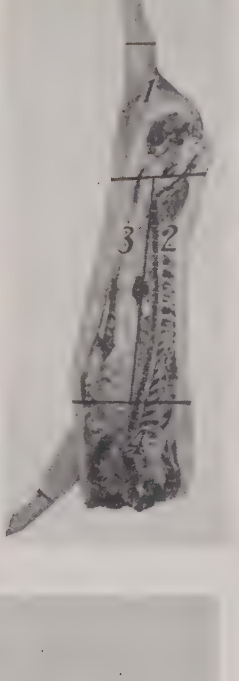
(Above) Lamb steak or chops (b) may be cut from leg (a). Trim as pictured for compactness.

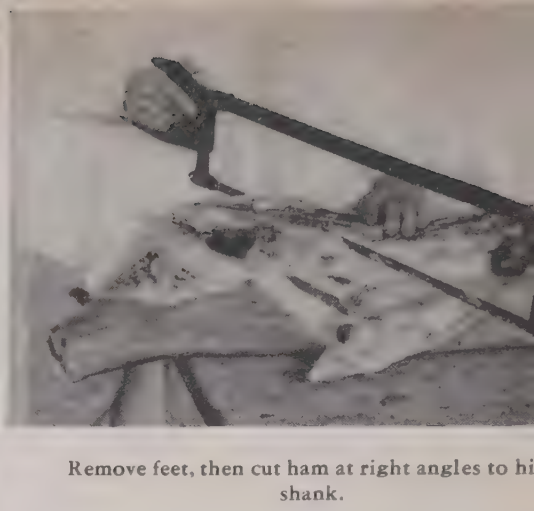
(Left) Storage space is saved by trimming bone ends of chops which package more compactly.

The meat cutting photographs for lamb, pork and beef reproduced on this and the following two pages are printed through the courtesy of the Bureau of Animal Industry, Agricultural Research Administration, U. S. Department of Agriculture, from the government folder *Freezing Meat and Poultry Products.*

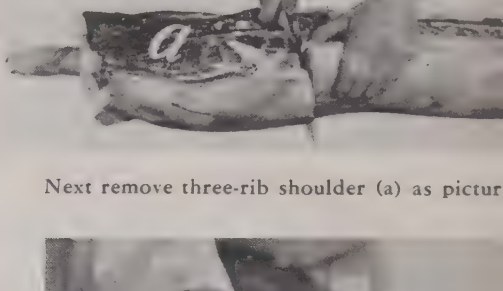
PORK

Cut or slice the thick ham (1), loin (2), and shoulder (4) into roasts, steaks, or chops. Trim the bacon strip (3) for curing, or cut into boiling pieces. Trim all meat closely, using lean for sausage and fat for lard.

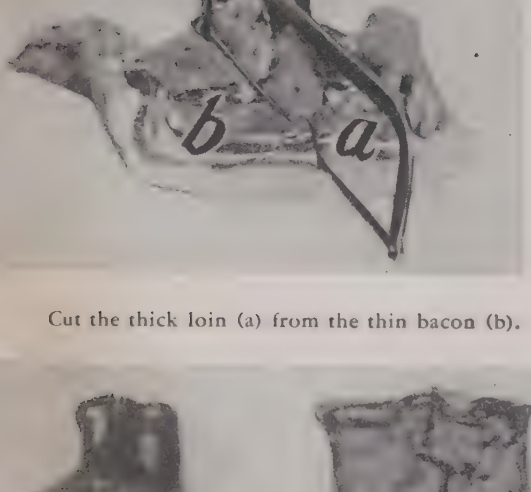




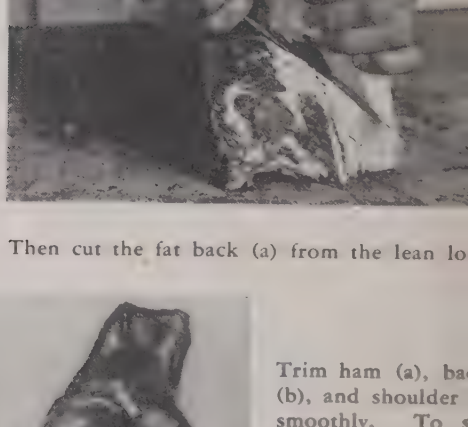
Remove feet, then cut ham at right angles to hi shank.



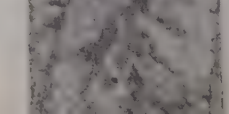
Next remove three-rib shoulder (a) as pictur



Cut the thick loin (a) from the thin bacon (b).



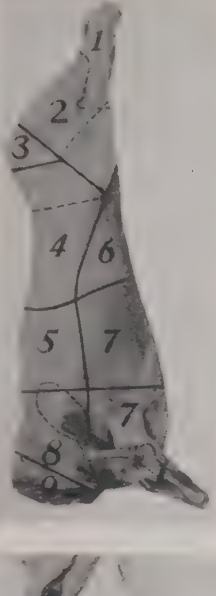
Then cut the fat back (a) from the lean lo



Trim ham (a), ba (b), and shoulder smoothly. To s freezer space these can be cured smoked, altho freezing the cu meats helps prese their fine flavor e cially during weather months

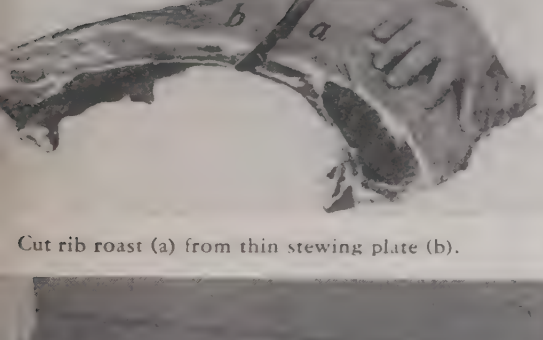
BEEF and VEAL

The thick, more tender loin (4) and rib (5) are suitable for frying and roasting; the chuck (8), rump (3), round (2), for Swiss steaks and pot roasts; the thinner shanks (1), flank (6), plate (7), neck (9), for stew and ground meat.

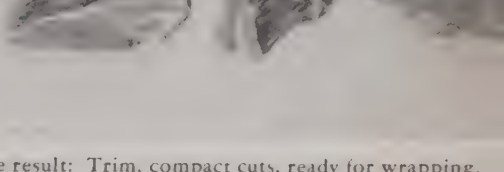


(Above) Cut round (a), rump (b), sirloin (c), and T-bone steaks (d).

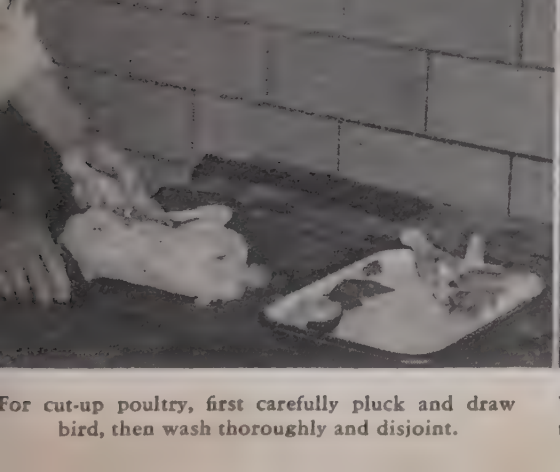
(Right) Bone round and cut into tip (a), top (b), and bottom (c). See below.



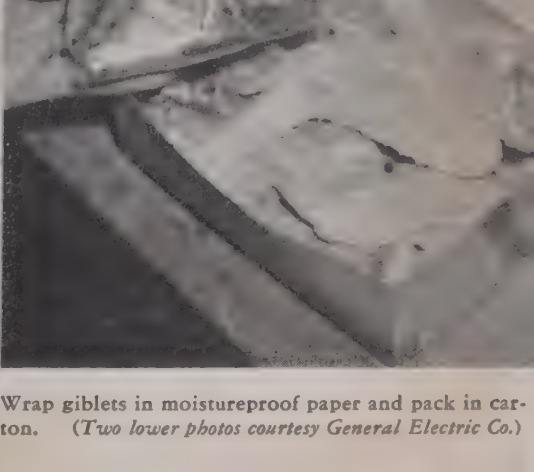
Cut rib roast (a) from thin stewing plate (b).



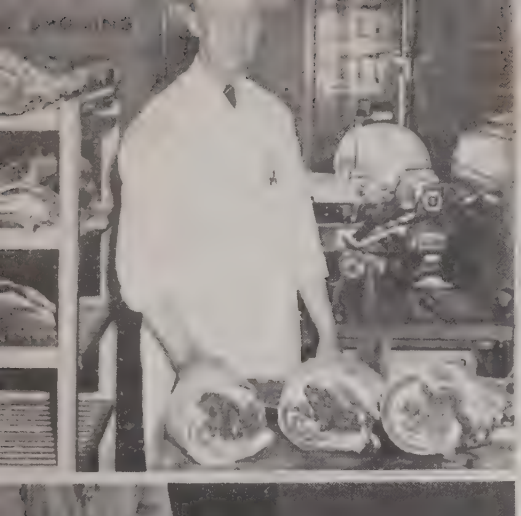
The result: Trim, compact cuts, ready for wrapping.

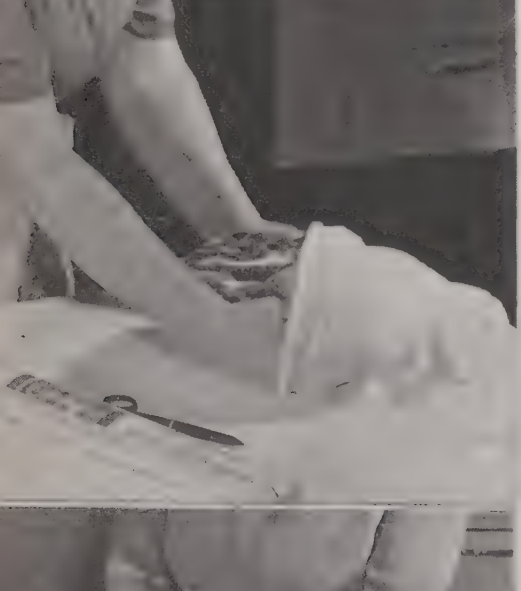


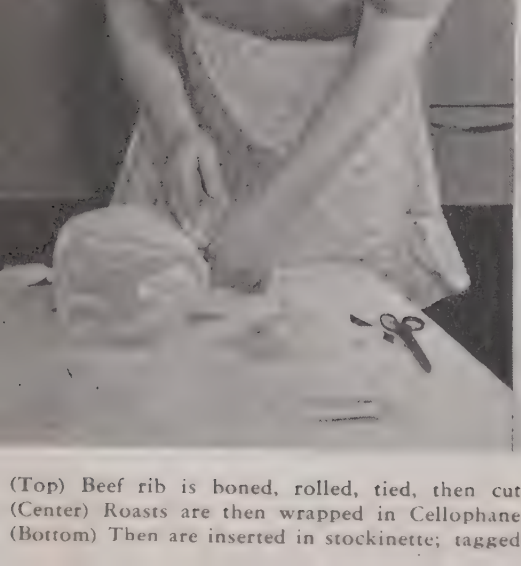
For cut-up poultry, first carefully pluck and draw bird, then wash thoroughly and disjoint.

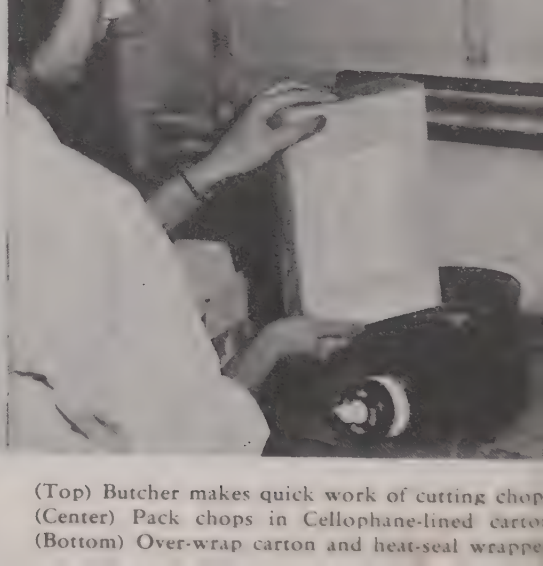


Wrap giblets in moistureproof paper and pack in carton. (*Two lower photos courtesy General Electric Co.*)









(Top) Beef rib is boned, rolled, tied, then cut. (Center) Roasts are then wrapped in Cellophane. (Bottom) Then are inserted in stockinette; tagged.

(Top) Butcher makes quick work of cutting chop (Center) Pack chops in Cellophane-lined carto (Bottom) Over-wrap carton and heat-seal wrappe

copper, gray or blue enamelware, and also white enamelware if it is chipped.

To serve or use pulpy fruit juices or purées, just let them thaw, then use or serve them immediately.

Almost all fruits make excellent purées; some fruits freeze well only when puréed, such as avocados, persimmons, or watermelon. You can also combine fruit flavors for purée—somewhat like adding goodness to goodness to make something super. Pineapple and apricot, apricot and peach, or peach and cherry are some of the good combinations; for others, use fruit preserve recipes as a guide to flavor selection.

Beef, Pork, Veal, Lamb, and Mutton

The factors governing successful freezing of meat may be listed as follows:

1. Careful selection of meat animals.
2. Proper butchering.
3. Aging of those meats where recommended.
4. Cutting into table cuts, or preparing for table use.
5. Proper packaging.
6. Freezing immediately.
7. Maintaining storage at 0° F., or below.

About Meat Selection

Bearing in mind the fact that freezing does not greatly improve the texture or quality of a product, but merely retains the original goodness, it is best to select for freezing only those live animals and poultry which are young and tender. Beef which is old and tough to begin with will still be tough when frozen and cooked, although freezing does tenderize meat to some extent.

Those persons raising poultry and meat animals will have no difficulty determining the age at which meat is

ready for slaughter, but there are many persons who wish to freeze meat who should seek the advice of an expert for help in the selection of beef and poultry which will be best for freezing.

About Slaughtering

The equipment needed for slaughtering and cutting up meat carcasses for freezing is not likely to be found in any but farm homes where animals have been slaughtered in the past; and it is not recommended that the average person who wishes to freeze meats purchase such equipment, for unskilled butchering can waste and spoil meat. Besides, this part of the meat freezing procedure can be purchased as a service, or arrangements can be made to buy bulk cuts from your butcher who will then cut the meat in table cuts.

Many locker plants have facilities for the cutting up of meat carcasses and will, in most instances, also package it for you. This locker plant service is provided by an expert butcher for locker patrons or customers owning a home freezer. The charges for such a service are usually quite reasonable.

If a meat cutting service is not available at a locker plant, consult an expert meat cutter and employ him to do this job for you.

In any case it may be desirable to study how carcasses are cut up when you attempt to freeze meat so you will be familiar with the type of cuts and know how to use each; i.e., whether you want certain portions ground for hamburger, or cut up for stew meat, or made into pot roasts. The photos following page 144 showing the different carcass cuts and how each is used will be helpful in determining how best to utilize each part of a meat animal. The following free pamphlets can also be recommended:

"Farm Slaughtering and Use of Lamb and Mutton"—

No. 1172; "Pork on the Farm, Killing, Curing, and Canning"—No. 1186; "Beef on the Farm, Slaughtering, Cutting, Curing"—No. 1415, all of which are Farmer's Bulletins obtainable from the U. S. Department of Agriculture, Washington 25, D. C.

"Cashing In on Beef," "Cashing In on Lamb," "Cashing In on Pork," and "Ten Lessons on Meat" are all obtainable from National Livestock and Meat Board, 407 South Dearborn St., Chicago 5, Illinois.

About Chilling and Aging

It is very difficult and also poor practice to attempt to cut up a freshly killed carcass of any meat animal. Meat cut from warm carcasses is soft and the cuts will not hold their shape; besides, when warm meat is put into the freezer, freezing takes place too slowly and spoilage may result. The carcass should be allowed to hang at least until it becomes cold, preferably chilled down to a temperature of approximately 32° F. Since freezing does not limit the butchering of meat animals to the cold months of the year as home butchering has done in the past, if the weather is warm, be certain to provide means of chilling the carcass in a cool room maintained at 32° to 34° F. This can be done in: (1) a chilling room at the local locker plant; (2) a chilling room at a meat market; (3) a chilling room in a home-owned walk-in cooler.

During late fall, winter, and early spring, carcasses of beef, veal, pork, and lamb can be cooled in a clean place on the premises provided the carcass is not allowed to hang at a temperature above 40° F.

Pork, lamb, and veal need not be chilled for longer than 24 hours; it is also not advisable to hold these meats much longer than 48 hours. This is especially true of pork because the fat of pork will not keep well. Pork fat

held in a cooler for 8 or 10 days prior to freezing turns rancid within a few months' storage at 0° F.; whereas the fat of pork held not more than 48 hours at 32° F. before freezing will remain in good condition at 0° F. for approximately one year.

Aging effects a marked tendering of beef, so it is recommended that beef carcasses be held near the freezing point (32° F.) for at least 5 days, preferably for from 8 to 10 days at this temperature.

If mutton is frozen, a better product will result if it is aged for a short period, as is done in Scotland and England. Allow 5 to 7 days for aging mutton.

Both temperature and humidity affect the aging process and are important. If humidity is too low, there will be loss of moisture from the carcass due to evaporation. If humidity is too high (above 90 per cent) meat is likely to become slimy due to bacterial growth, necessitating severe trimming of the carcass. Sliminess is much more likely to occur on cut than uncut surfaces.

High temperature hastens aging (40° to 45° F.) since it speeds the tendering process, but there is great danger from bacterial and mold growth. When beef animals are slaughtered during late autumn, winter, and early spring on the farm, they may be aged for the proper period provided the temperature does not rise above 40° F. nor fall below 28° F. If weather is too warm, spoilage may result; it is also unwise to allow the carcass to freeze before cutting and packaging. Should weather turn extremely cold, protect the carcass by covering it up, or by taking it into a heated room.

Preparing for Table Use

Cut carcasses into commercial cuts (loins, legs, rounds, etc.), then into table cuts (steaks, chops, roasts, etc.).

Less desirable pieces such as the shank, brisket, flank can be boned and cut up into stew meat, can be made into corned beef, or ground to make hamburg or Salisbury steak, meat loaf, etc. The size of your roasts and steaks should be determined by the size of your family; if it is large, you will want larger roasts and steaks; if small, the smaller cuts will be more practical.

To conserve freezer space, pieces of meat containing a high percentage of bone should be boned before freezing. A rolled roast, for example, takes up much less freezer space than a standing rib roast, and sirloin cuts of steak pack more compactly than T-bones. After boning roasts roll the meat tightly, tie, then cut into family-size pieces.

Contrary to what most persons think, a fore quarter of beef provides a slightly greater proportion of usable meat than a hind quarter, in some instances as much as 6 per cent more.

Proper Packaging

It is best to pack meats in small packages for they will freeze faster than large ones. Pack one roast, or one large steak to a package; two medium steaks; 4, 6, or 8 chops; 4, 6, or 8 hamburg patties; etc.

Some meats can be packaged in shallow Cellophane-lined, rectangular waxed paperboard cartons similar to those used for vegetables. Cartons measuring 4 inches by 6 inches and $1^1/_2$ inches deep are suitable for hamburger and sausage. Larger ones about 8 inches by 10 inches and 2 inches deep are best for steaks and chops.

Roasts because of size, shape, and bulk are wrapped in moisture-vaporproof paper or sheeting, then inserted in a stockinette (similar to that used on commercial hams) so as to hold the wrapping close to the surface of the meat and to protect the wrapping from tearing during storage.

There are several excellent moisture-vaporproof sheetings on the market: moistureproof Cellophane; specially coated vegetable parchment paper; Pliofilm; aluminum foil laminated (fused together) with moistureproof paper; and aluminum foil laminated with moistureproof Cellophane. These sheetings give not only the proper protection against drying out, but are stainproof as well. *Never* use plain butcher paper for wrapping meats, as it has none of these qualities for protection of your meats during frozen storage.

Meat, especially, must be protected from drying out during freezing and storage. Otherwise, the surface fat loses its film of moisture, oxidation takes place, and rancidity results.

All meat packages should be labeled, indicating contents and date packed. This can be done with a soft crayon or china-marking pencil where meats are packaged in cartons; wrapped meats should have a tag bearing this information which can be either tied to the package or slipped underneath the stockinette. If a kitchen scale is available, it is also advisable to label the packages with the weight of the contents as this will help you to determine cooking time for roasts and broiling time for thick steaks.

Roasts: Wrap each roast individually, using a flexible moistureproof sheeting such as mentioned above. Wrap so as to eliminate as much air from the package as possible by pressing the wrapping close to the roast. In almost every instance, it is good practice to slip the wrapped roast into a stockinette (described above) by first tying the loose end of the tubular webbing, inserting the roast, and pulling the stockinette tight around the meat; then cut off webbing leaving enough length to tie the remaining end securely. Tie label to one end of stockinette, or insert label under stockinette before the package is tied.

Steaks, Chops: Trim steaks and chops of excessive fat or bone, then

pack into large-size waxed rectangular top-opening carton which has been lined with a sheet of moistureproof Cellophane or vegetable parchment paper. Cartons are deep enough for two layers of steaks or chops if of medium thickness. Separate each layer of meat with *two pieces of moistureproof paper or Cellophane* to keep them from freezing together so they can be separated while still solidly frozen. Tuck moistureproof lining of carton around top and sides of meat; close carton; label package; then overwrap carton with moistureproof Cellophane or other heat-sealing paper, heat-seal the overlapping edges to make the package airtight.

Bulk Ground Meat: Bulk ground meat (hamburg, sausage, etc.) is simply packed in a lined carton such as is used for vegetables; or, in a heavily waxed tub type container such as is used for fruits; heat-seal the carton or container if necessary.

Ground Meat Patties: Package same as steaks and chops.

Swiss Steak: Depending upon size and shape; can be packaged same as a roast, or in carton same as a steak.

Bulk Stew Meat: Package same as a roast.

Cut-Up Stew Meat: Package same as bulk ground meat.

Legs and Shanks: Package same as roasts.

Variety Meats: Heart, liver, etc., may be frozen although they do not retain their freshness in long-continued storage as the other meats do. No longer than 4 or 5 months' storage is recommended for frozen variety meats. Hearts and livers may be sliced and packaged the same as steaks.

Freeze Meat Immediately

Meat is too costly to take any chances with spoilage, so get it to the freezer immediately after it is packaged and ready. Since it takes approximately 14 hours to freeze a $3^3/_4$-pound roast in still air at $-10°$ F., and about 7 hours at the same temperature in an air blast, you can readily see the need for getting meats into the freezer as quickly as possible. Meats should be brought down to at least 0° F. within 24 hours, so do not pack a home freezer too tight with unfrozen meats, else freezing will take place too slowly. If you have a great quantity to freeze, it is

better to take it to a locker plant for freezing and when frozen, transfer it back to your home freezer.

Importance Of Zero Storage

The deterioration of pork is much more noticeable than in the case of other meats if the storage temperature fluctuates widely above 0° F. temperature. At 10° to 15° F., pork will not keep in good condition longer than 4 months; at 0° F., or below, it will keep well for as long as 12 months.

Should You Freeze Cured Meats?

The answer is, yes, if your freezing storage space permits. However, it is not recommended that cured meats be frozen at the expense of fresh meat preservation. If there is room in the freezer, especially during summer months when the fat of cured and smoked meats is likely to become slightly rancid, by all means freeze cured and smoked meats as freezing will keep them in perfect condition.

Care should be taken in packing cured meats in tight packages, particularly those which have been smoked. If smoked meats are poorly packaged and placed in a home freezer or locker, the flavor of the smoke will travel to other products held in the freezer.

Pointers for Making Sausage for Freezing

In making sausage for freezing, remember two things about seasonings: (1) salt seems to accelerate the development of rancidity in fat meats; (2) spices and other seasoning ingredients actually retard the development of rancidity. So add all the seasoning ingredients *except salt* which may be added just before or during cooking.

If salt is added to the sausage before freezing, do not keep it for more than 6 months at 0° F., otherwise it can

be kept as long as 9 to 10 months at this temperature.

Back fat, loin trimmings, shoulders, blade meats, or butts make excellent sausage when made in the proportion of 50% fat and 50% lean meat. Belly trimmings or jowls may also be used for sausage making if the pork carcass is in excellent condition. Keep the pork cold while working with it; and keep it away from contact with equipment or tools that have been used to handle cured meat. Have all grinding equipment thoroughly clean. Grind meat with $^1/_8$-inch, $^3/_{16}$-inch, or $^5/_{32}$-inch grinding plates. As pork is ground, sprinkle with the seasoning ingredients (except salt). Mix only long enough to distribute the seasonings evenly—a too long mixing period will cause "smearing."

What to Do with Bones and Trimmings

Excellent soup stock can be made from the quantity of bones taken from meat when freezing. Make soup stock in the regular manner, then freeze the stock by pouring it into water-tight containers (such as are recommended for fruits), allowing about an inch at the top for expansion of the liquid during freezing.

There will be considerable trimmings from a carcass, too, which can be cooked with the bones and used in the soup stock (it need, or need not be strained out before freezing); or trimmings may be frozen for use as dog food.

Poultry: Chickens, Ducks, Turkeys

Like all other foods, select only the best for freezing; young, healthy well-finished birds. The Poultry And Egg National Board published the following characteristics for best selection of chickens:

Broiler: 1 to 2½ lbs.; 8 to 12 weeks old; smooth, thin skin; tender muscles with very thin connective tissue; small amount of fat under skin over the back; flexible tipped breastbone.

Fryer: 2½ to 3½ lbs.; 14 to 20 weeks old; same as above except size and age, meaty enough to be disjointed and cut into serving pieces; noticeable layering (finish) of fat underneath the skin.

Roaster: Over 3½ lbs.; 5 to 9 months' old male; tender, soft-meated muscles; smooth skin; large enough in size and meaty enough to be roasted whole; excellent layering of fat underneath skin; flexible tipped breastbone; connective tissue only slightly more developed than in fryer but still thin.

Capon: 4 lbs. and over; 7 to 10 months' old unsexed male; popular size 6 to 7 lbs.; full-breasted, yielding a high proportion of white meat.

Pullet: 2½ to 5½ lbs.; 4 to 9 months' old young hen; similar to roaster except body is shorter and plumper; flexible tipped breastbone; smaller weights often used as fryers.

Fowl: Female of any weight; age over 1 year; thick, coarse skin; muscles well developed with thick connective tissue; high proportion of fat underneath skin; breastbone no longer flexible.

In selecting turkeys and ducks, the same general characteristics given for roasters above will help to obtain the best selection. Both ducks and turkeys should be plump and full-breasted, preferably with a short body. If you want turkeys from 8 to 15 pounds, select hen turkeys; at this weight they are usually better finished than toms of the same weight. Select tom turkeys if you want birds weighing from 16 to 25 pounds, or over.

Killing the Birds

Birds should be starved for 24 hours prior to killing in order to empty the crop and intestines. Good bleeding is essential to good freezing preservation which makes the following killing procedure the recommended one: hang the bird by the feet; with a sharp pointed knife in one

hand, and holding the mouth of the bird open with the other, insert point of knife down throat and sever the jugular vein (bird will start bleeding immediately). Then insert the knife blade in the cleft of the roof of the mouth, running it back in a line between the eye and ear to pierce the third lobe of the brain and giving it a quarter turn to destroy brain tissues. Main tail and wing feathers can be removed immediately.

When picking the birds, avoid bruising or tearing the skin; caution must also be taken not to over-cook the skin when scalding to remove feathers. Either dry picking or semi-scalding is recommended. These methods of removing the feathers can only be done when the birds have been bled and debrained as described above. To semi-scald, do not use boiling water, but water at only 125°–130° F. for from 20 to 30 seconds. Remove pinfeathers either by singeing or by the wax method (see page 207 for wax method). Refrigerate overnight before preparing for freezing.

ROASTERS

Prepare: Remove head, shanks (feet), and oil sac. Make cut in abdomen as small as possible, and draw carefully, making sure lungs are completely removed. Wash thoroughly in cold running water; drain. Clean and wash liver, gizzard, and heart.

Package: Wrap giblets separately in moistureproof paper and insert in cavity of bird; then wrap for freezing the same as roasts; label indicating weight of bird as well as date and contents.

Freeze immediately and store at 0° F., or below.

BROILERS

Prepare: Remove head, shanks (feet), and oil sac. Then carefully draw bird. Young, soft-boned birds can be split down the back from neck to rear along the backbone, and then cut in two pieces along the breastbone. Wash thoroughly in cold running water; drain. Clean and wash liver, gizzard, and heart.

Package: Place halved bird (which can be quartered when cooked if desired) together with two pieces of moistureproof paper between halves. Wrap giblets separately in moistureproof paper and place between the halves. Wrap for freezing the same as roasts; label.

Freeze immediately and store at 0° F., or below.

DISJOINTED CHICKEN

Prepare: Remove head, shanks (feet), and oil sac. Draw bird and cut up or disjoint. Wash thoroughly in cold running water; drain.

Package: Use flat, folding waxed carton (such as is used for steaks) which is large enough to hold all the pieces; pack pieces in carton, wrapping giblets separately in moistureproof paper before they are placed with the other pieces; close carton; label; over-wrap carton with moistureproof Cellophane or paper and heat-seal over-wrapping.

Freeze immediately and store at 0° F., or below.

Fish

Freeze fish the same day they are caught if possible. If not possible, be sure to refrigerate until freezing can be undertaken. Prepare fish for freezing just as for cooking: Scale, eviscerate, and wash thoroughly. Behead and cut off fins. Freeze small fish whole; cut large fish into steaks or fillets. Steaks are prepared by cutting the fish crosswise, retaining one vertebra in each steak. Fillets are cut, one from each side of the fish, running the knife along the backbone, removing a fillet, then turning the fish over and cutting the similar piece from the other side of backbone. The few bones remaining in the fillet may be pulled or cut out.

Fillets and steaks cut from lean fish such as haddock and cod should be immersed for 20 seconds in a 10% brine solution (1 lb. salt to $4^1/_2$ qts. water) to reduce leakage when the fish is thawed. (Fatty fish such as salmon and mackerel should not be brined.) Remove lean fish

from brine and let drain a few seconds before packaging.

To package, wrap individual fish fillets or steaks in moisture-vaporproof paper or sheeting and pack in flat, rectangular folding waxed carton; close carton; label; over-wrap carton with moistureproof Cellophane or paper and heat-seal. Fish may also be wrapped only in strong, heavy, moisture-vaporproof paper and tied or taped securely.

Whole fish may be given an ice glaze for protection during storage. First place the fish in the freezer to freeze; as soon as it is frozen, take fish out and dip it in near-freezing ice water; place it back in the freezer a few minutes to harden the glaze; take fish out again and repeat the dipping. When a good glaze has been formed, wrap the fish in moistureproof paper and store in the freezer. The ice glaze needs either a wrapping for protection against chipping during storage, or the glaze must be renewed every few weeks.

Shellfish

Wash oysters, clams, and scallops in clean sea water (if it is obtainable) diluted with an equal volume of fresh water, or use a brine containing 1% salt. Pack in liquid-tight containers such as are used for fruit, allowing headroom for expansion.

Crabs and lobsters should be steamed or boiled in water for 15 to 20 minutes; then cooled, and the meat taken from the shells. Package cooked meat in cartons such as are used for either fruits or vegetables.

Since cooked shrimp toughens during storage, it is best to remove and discard the heads, then package and freeze meat in the shells without cooking.

Dairy Products

EGGS

Eggs should not be frozen in the shell, since freezing causes them to expand and crack. They should be broken out of the shell and frozen either with or without separating into yolks and whites.

For Cooking—It is best to freeze eggs with a purpose, i.e., in small packages containing specific amounts for certain purposes such as for angel cakes, or for mayonnaise. For once eggs have been frozen, stored, and thawed, they should be used immediately; any left-over thawed eggs may be wasted. Neither can eggs for cooking and eggs for mayonnaise and salad dressing be used interchangeably because eggs for cooking are frozen with sugar or corn syrup, and eggs for use in mayonnaise and salad dressing are frozen with salt. Egg whites frozen separately, however, may be used for any cooking purpose because they are frozen "as is" without the addition of any sweetening agent or salt.

It is the yolk of the egg which becomes gummy if not mixed with either corn syrup, sugar, or salt. For separate whites, simply freeze desired amounts in suitable container.

Mix separate yolks with either 1 tbsp. of sugar or corn syrup per cup of yolks; or 1 tsp. salt per cup of yolks.

Mix whole eggs with either 1 tbsp. of sugar or corn syrup per each 2 cups eggs; or 1 tsp. salt per each 2 cups.

To Package Eggs: Small paper muffin cups are excellent for freezing the egg requirements of a 2- or 3-egg butter cake; pour mixed amount into the cups which have been placed in muffin tins to hold their shape; freeze; then remove and wrap with moisture-vaporproof paper and heat-seal.

When larger quantities are frozen, they can be poured into a con-

tainer such as is used for fruit, allowing headroom for expansion during freezing.

Egg cubes (each containing approximately either 1 whole egg, 2 egg whites, or 2 egg yolks) can be frozen by pouring the eggs into a refrigerator tray, using the ice cube divider. Freeze the product in freezer and when frozen, remove the individual blocks (as you would ice cubes—although more carefully), wrap in moisture-vaporproof paper and pack in a flat, folding waxed carton for storage.

For Poaching and Frying—A quite satisfactory method of freezing whole eggs without the addition of either sugar or salt has been found which will make them usable for either poaching or frying.

Line muffin tins with paper muffin cups. Break and carefully drop an egg into each, taking care not to break the yolk, freeze; remove paper cups from tins; pack in a flat, folding waxed carton for storage; over-wrap carton and heat-seal with moistureproof paper or sheeting.

CREAM

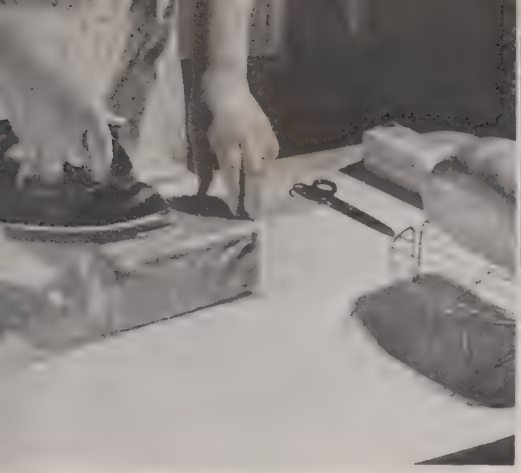
Cream containing 40 per cent, or more, butter fat can be frozen and stored for a few months without marked deterioration. The cream should first be pasteurized, then packaged in heavily waxed containers (liquid-tight ones such as are used for fruits), labeled, and frozen as rapidly as possible. It should be stored at the lowest temperature available. Before use, the thawed cream should be put through a Club Aluminum hand homogenizer in order to make it smooth.

CHEESE

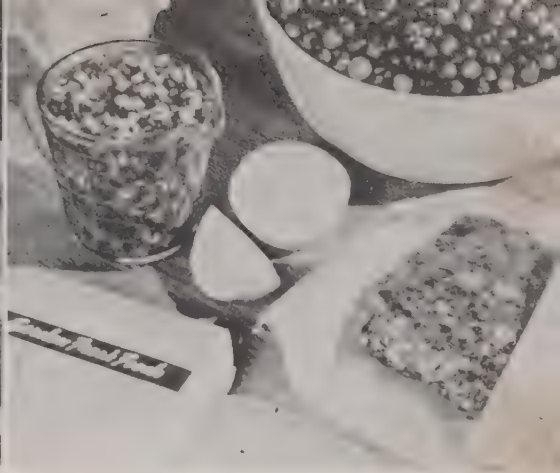
If wrapped in moisture-vaporproof paper and heat-sealed, cheese can be frozen and held in storage for about six months at 0° F. Cheese is not noticeably changed in texture or flavor by freezing.

BUTTER and LARD

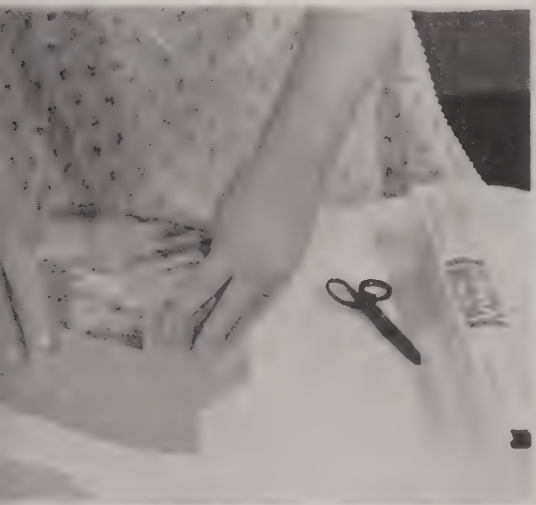
No special preparation for packaging is necessary to freeze butter or lard. It may be packed in tins lined with vegetable parchment paper, in waxed cartons lined with parchment paper, or in parchment paper alone. Either of these products will keep far better at 0° F. for a much longer period of time than they will in an ordinary household refrigerator.



bread cool, then wrap in Cellophane; heat-seal.



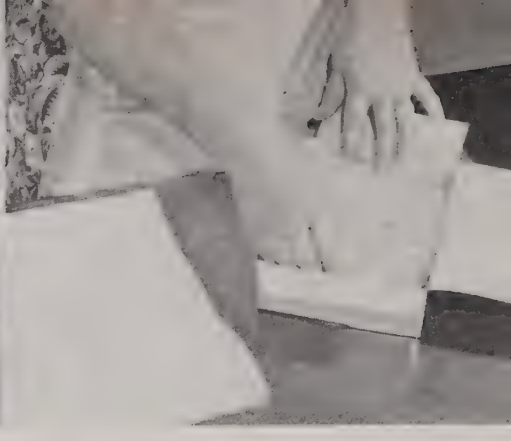
Delicious cranberry orange relish freezes well.



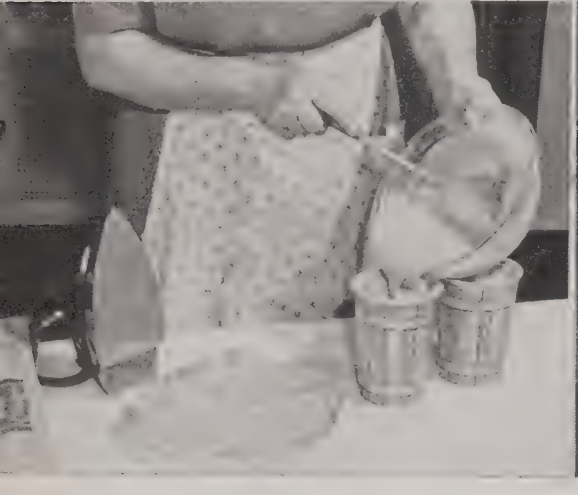
me-made paper "collar" helps protect angel food.

Seal it in with a wrap of moistureproof Cellophane.

ace paper plate over baked pie for protection. Then wrap in moistureproof Cellophane, heat-seal.



Unbaked yeast dough may be shaped, greased and packed in Cellophane-lined carton for freezing.



Freeze cake batter in greased pan or carton.

Wrapping rolled cookie dough in Cellophane

Attractive and complete meals can be prepared from frozen foods. *Photo courtesy Birds Eye Snider, Inc.*

Chapter VIII

A DELICATESSEN AT YOUR FINGERTIPS

NEWS ITEM: Province of Quebec, Canada, October, 1888—An early winter with heavy snows is predicted for this section of the country. This warning is issued so that adequate preparations may be made to insure protection for livestock and sufficient food supplies. Those women who have not yet baked their winter's supply of bread will be wise to do so immediately before inclement weather makes this impossible.

Authors' Note: Those who have traveled through Quebec and Nova Scotia have probably noticed the quaint outdoor bake ovens used by the French Canadians for baking their famous breads. Through many, many years it has been a practice of these native women to hold "bake days" in the early fall of each year at which time enough bread is baked for the winter's needs, because snow and cold make the outdoor ovens inoperative during winter. The baked goods then are wrapped and stored out of doors where the bread freezes and keeps in excellent condition throughout the winter. Each day the bread supply is brought into the house in the morning to thaw and be in readiness for serving at mealtime.

A FREEZER FOODS STORE

NEWS ITEM: Winnetka, Ill., September, 1943—North Shore homes are resounding with praise these days about a novel store which has opened up to serve residents of this area with nothing but *frozen foods*, including, believe it or not, baked apple, blueberry, and peach pies, frozen cookies, blueberry muffins, beef stew, chicken a la King, cream of tomato soup, spaghetti and meat balls, Welsh

rarebit, and many, many other frozen cooked foods which only have to be thawed and heated to serving temperature and they are ready to eat.

It seems certain that this new store will find a ready market among busy wartime housewives who also are finding feeding problems complicated by the appearance of an acute meat shortage. For those fortunate homes where a home freezer is installed, the store is making once-a-week deliveries of frozen foods in bulk to supply the perishable food needs of the family for the week.

Authors' Note: The appearance of a store devoted solely to frozen foods introduced to the public the trend of marketing both commercially prepared fresh and cooked frozen foods. We will see this phase of the freezing picture take shape rapidly all over the country now in the postwar period. In the near future, hardly a department store foods department, a super market or corner grocery will be without an almost complete line of frozen foods of all kinds including a wide variety of rolls, cakes, pies, bread, and prepared dishes. Frozen food items will become a part of your regular shopping list the same as canned foods, sugar, flour and coffee now are.

The Case of the Thousand Tea Sandwiches

News Item: Bridgeport, Conn., September, 1944—Here is food for thought about the vast possibilities of freezing foods other than those we've heard generally talked about.

Somewhere along the way between the program chairman, the foods committee, and the caterer employed to supply the 1,000 tea sandwiches for the opening meeting of the Wilson Club's active winter season, the date for their September Tea got mixed up. The caterer delivered her order of 1,000 tea sandwiches on time—in plenty of time, in fact—just ten days before the Tea was to take place. Bedlam reigned until two club members who were experienced with freezing foods remembered a freezer which might be available for keeping the "made"

sandwiches until Tea time ten days later. Space in a freezer fortunately was procured, and the sandwiches doubtfully deposited within. The day of the Tea arrived and the sandwiches were taken out of the freezer in time to warm up to room temperature; they were served and none but the foods committee who participated in the near-catastrophe were aware that the tasty, delicate sandwiches had been made ten days earlier—by mistake.

Authors' Note: This incident happened to the women employee's club of the General Electric Company. A great deal of food as well as expense was saved by freezing those 1,000 sandwiches in the test freezer which happened to be on hand in the company's laboratory.

Ready-to-Bake Products Introduced

News Item: Oak Park, Ill., March, 1945—A new enterprise built entirely around the preparation and freezing of bakery goods has been introduced to the Chicago trade by E. Gordon Male, who has been experimenting with the freezing of yeast doughs for the past seven years, and who has established a store in Oak Park as well as wholesale distribution with the Chicago Frozen Foods Co. to sell baked goods in dough form so the housewife can serve real home-baked products with the least amount of effort. The store, which opened for business on January 2, finds that many housewives also buy Frigid-Dough products in quantity for storage in their home freezer cabinets. A typical example is the woman who makes a trip regularly to the store every ten days or two weeks to purchase a dozen boxes each of cloverleaf rolls and breakfast rolls.

Authors' Note: Bakery-bought baked products do not taste as fresh as those just out of the oven; neither can they be warmed up to taste the same as freshly baked pies, cakes, or rolls which explains in part the success of this venture.

Novel Hollywood Restaurant Opens

News Item: Hollywood, Calif., November, 1950—Famous chefs round the world are featured at Taminoff's restaurant, which made its fabulous debut to the èlite of Hollywood amid typical Hollywood fanfare.

To say Taminoff's is a different restaurant puts it mildly. Different, or not, it is doing a thriving business in Hollywood where the bizarre is always popular. It is the first of its kind to make an appearance on the American scene. It serves nothing but frozen foods and these are the foods direct from world-wide famous chefs, costing from $10 to $25 a dinner. Taminoff has made arrangements with Continental, Asiatic, and Oriental chefs as well as those in this country noted for their fine food, including, of course, Oscar of the Waldorf, to supply him with their famous dinners which are quick frozen on the spot and shipped to Hollywood where they are put in frozen storage until ordered by one of his diners. Then while milady poses for the publicity camera or sips her favorite cocktail, the dinner from perhaps halfway round the world is heated to serving temperature, and served.

Authors' Note: If the above 1950 news items should expose or coincide with future plans of any restaurateur, it is purely incidental and altogether possible.

The many-faceted frozen cooked food picture becomes more exciting as the years unfold new developments that make the freezer more than ever a "chest of magic."

Frozen cooked foods can serve the homemaker's end in limitless ways bounded only by her own desires, imagination, and forethought.

Consider the daily chore of preparing lunches for the school child or worker. This task can be minimized to merely making a trip to the freezer to get a complete frozen lunch for either purpose. Such a frozen lunch

might consist of sandwiches; mixed fruit salad, or tomato or orange juice; cake, cookies, or pie. By noontime the frozen lunch carried to school or to work will be thawed and ready to eat.

Then there is the family who spends week ends at a camp cabin. Up until the time the home freezer entered family life in the rough, food supply was always the first and last thing they had to worry about—getting all the perishable food supply upon arrival and consuming or disposing of all but the staple flour and sugar items before leaving. Now with the freezer, a supply of fresh bread, rolls, and baked desserts can always be on hand as well as meats, butter, vegetables, and cooked camp delicacies such as real hole-baked beans. Not to mention the convenience of having prepared foods ready to heat and serve, there's the time saved for the women to really enjoy the holidays, too.

Aside from the special instances where frozen cooked foods serve the family well, there is the every-day advantage of having a virtual delicatessen at your fingertips; breads, pies, rolls, cakes, and prepared dishes which can be whisked into the oven on a moment's notice for unexpected company or for hurried meal preparation when the cook gets home too late to be more leisurely about it.

There is the woman (she is probably only one of hundreds) who has once again hunted up her favorite home-made bread recipe and taken to making it regularly because, she says, "my family always liked it much better than any other—that is, they did the first day or two it was baked and not dried out. Now, with my freezer, each loaf I bake is oven-fresh as I take it out of the freezer and warm it to serving temperature, or serve it at room temperature."

Other women who have freezers plan to have left-overs of prepared dishes that take a long time to fix, a lot of fuel, or special ingredients—dishes such as oven-baked beans or chop suey. You remember easily the day these foods either had to be served to a large family, or they had to be eaten day after day until the last spoonful vanished (sometimes surreptitiously in the garbage can), or you had to laboriously dissect a large-quantity recipe into ingredients for a one-meal serving. With a home freezer that day is gone forever and now you can plan double your recipes of those dishes which will freeze well, serve what is needed at the first meal and freeze the remainder, thereby making the meal preparation of one meal do the work for several.

What Cooked Foods Will Freeze?

A few vegetables such as squash and beets may be classed with the cooked food group since they are cooked until done during their preparation for freezing. The same is true of some of the shellfish, such as lobster and crabmeat.

Some of the vegetables (carrots, asparagus, peas, spinach) may be cooked until done, then puréed (see p. 143) and frozen for use in cream soups, baby foods, etc.

All meats with the exception of pork and pork products such as sausage will freeze well already cooked as roasts. Fried meats lose their crispness, become soggy, and develop a "warmed over" flavor during storage. Roast fowl and turkey freeze well, too. With large fowl and turkey this is especially helpful because there always seems to be some left over no matter how carefully we plan the size for the occasion. After frozen storage it can be reheated to serving temperature, or thawed and sliced for serving cold. The meat may also be removed

from the frame before it is frozen, packed into containers such as are used for freezing fruits, then covered with a cream sauce or gravy for use later in meat pies, hash, or croquettes. Meat pies may be made and baked before they are frozen, or they may be frozen unbaked and baked when taken out of the freezer at serving time.

Included in other meat and prepared foods which can be cooked and frozen are chop suey and chow mein, oven-baked beans, candied sweet potatoes, corned beef and corned beef hash, Creole spaghetti, spaghetti and meat balls, Spanish rice, beef stew, veal and lamb stew, chicken a la King, Welsh rarebit, hamburg steak, codfish cakes, seafood en casserole, cooked vegetables in sauces (such as Harvard beets), French fried potatoes, cottage fried potatoes, mashed potatoes, potato chips, and pork and beans with tomato style sauce.

Asparagus purée, split pea, navy bean and mixed vegetable are among the soups that freeze well.

All kinds of baked bread, rolls, and muffins freeze well; so well, as a matter of fact, that there is no difference from the taste or texture of the same freshly baked products.

Angel food, sponge and butter cakes *with icing*, all types of cup cakes, and every kind of cookie are excellent products to bake and freeze. For icing cakes, cup cakes, and breakfast rolls, use the cooked or butter icing; that made with egg whites will not stand up under freezing and storage.

Pies and pie mixes (pumpkin, mince meat, sweet potato) may also be frozen very successfully. Fresh fruit pies top the list as favorites, although the cornstarch or tapioca thickened cream-filled pies will also freeze well, and that includes your favored lemon and chocolate. But be wary of the custard type of filled pie as the filling is likely to coagulate during freezing and storage.

All types of bread, and cookie dough in bulk or already shaped for baking, and cake and muffin batters will also freeze well. Then, upon thawing, they can be baked as one would the fresh product.

Dough vs. Baked for Freezing

When the subject of baked frozen foods is under discussion the question most often asked is "Which is better—the frozen baked product or the frozen unbaked product?"

Actually, either way is entirely satisfactory and there are points in favor of both procedures. When frozen unbaked pies are baked the crust seems to be better browned and the crust is crumblier. Not flakier, mind you, but crumblier—more fragile. Pies which are frozen unbaked need no thawing before they are put into the oven to bake. On the other hand, bulk doughs which have not been shaped prior to freezing, do have to be thawed and it takes considerable time for frozen doughs to thaw.

Although storage tests have been somewhat limited, they indicate that the baked and frozen products remain in better condition for longer periods of storage. For instance, it is not recommended that an unbaked pie be stored in the freezer for longer than 6 to 8 weeks; while a pie baked before being frozen can be stored for 4 to 6 months. However, it is probable that you would want to draw upon your supply of frozen baked goods regularly, just as you do other frozen foods, and from 6 to 8 weeks may suit your convenience, except in those instances where a winter's supply of fresh berry or fruit pies is made when the fresh fruit is in season. Then, of course, to get the best results, it is wise to freeze the baked pies.

When fruit pies are frozen unbaked, prepare the filling

before putting it in the pastry using quick tapioca, corn starch, or flour as the thickening. This will insure against your frozen unbaked pies having soggy bottom crusts.

How to Freeze Cooked Foods

Use your favorite recipe in preparing any of those cooked or baked foods which freeze well, being careful in the case of prepared dishes not to overcook the food. Overcooked food when frozen, stored, and reheated to serving temperature will be mushy and taste like warmed-up left-overs rather than the freshly prepared food.

Quickly cool the foods after cooking or baking before packaging them for freezing. Then package them in the same kind of moisture-vaporproof materials used for freezing other foods; and use the same care in heat-sealing containers (where needed) and in heat-sealing the overlapping edges of wrapping materials or sheetings (such as moistureproof Cellophane).

Freeze immediately and maintain storage at 0° F., or below.

When seasoning foods which are to be frozen, remember that during storage onion flavor becomes less noticeable and celery flavor becomes more pronounced. Spices, also, seem to lose potency through long frozen storage.

Packaging Suggestions

BREAD

Baked—After loaves are thoroughly cooled, wrap each loaf in moistureproof sheeting, heat-sealing overlapping edges.

Unbaked Loaves—After dough has raised once, punch down, shape loaves; wrap individually in moistureproof Cellophane and pack in folding waxed carton of suitable size; label and over-wrap carton with moistureproof sheeting and heat-seal or freeze in greased pans in which loaves are to be baked. Wrap pans in moistureproof Cellophane and heat-seal.

Unbaked Bulk—After dough has raised once, punch down, pack in folding waxed cartons lined with moistureproof Cellophane; overwrap carton, label and heat-seal.

ROLLS

Baked—Turn raised pan rolls out of pan after baking to cool thoroughly before packaging; wrap in moistureproof Cellophane, and heat-seal.

If individual dinner rolls such as cloverleaf rolls are frozen, allow them to cool, then pack them in folding waxed carton, label, then over-wrap carton with moistureproof Cellophane and heat-seal. Baked dinner rolls may also be packaged in a large moistureproof Cellophane bag which is then heat-sealed.

Unbaked—After dough has raised once, punch down, shape and fill baking pan; wrap pan in moistureproof Cellophane and heat-seal. If cloverleaf rolls are desired, they may be shaped and placed in paper baking cups for storage; the cups are then packed in folding waxed cartons which are labeled and over-wrapped with moistureproof Cellophane and heat-sealed.

Unbaked bulk rolls may be packaged the same as unbaked bulk bread dough.

MUFFINS

Baked—Pack in folding waxed carton, label, and over-wrap with moistureproof Cellophane, and heat-seal; or package in a moistureproof Cellophane bag the same as dinner rolls.

Unbaked—Batter may be poured into any moistureproof container such as is used for freezing fruits of a size best suited to the quantity of batter.

CAKES

Baked—If the standard 8- or 9-inch layer pan is used a single layer will fit into a small-size pastry folding box. First wrap cake in moistureproof Cellophane; place in folding carton; label carton and over-wrap with moistureproof Cellophane, then heat-seal.

Angel and sponge cakes are wrapped in moistureproof Cellophane after thorough cooling and the Cellophane heat-sealed. If no protective carton can be found suitable to the size of the cake, a paperboard "collar" fitted around the sides and cut-out paperboard "rounds"

for top and bottom will give some protection against abuse in the freezer; or the cake may be frozen in the pan in which it was baked.

Unbaked—Batter may be poured into any moisture-vaporproof container such as is used for freezing fruits, of a size best suited to the quantity; or, it may be poured into the greased cake pans in which the cakes are to be baked, then frozen, and then wrapped in moisture-proof Cellophane and heat-sealed.

CUP CAKES

Baked—Pack in folding waxed carton, label carton, and over-wrap with moistureproof Cellophane, heat-seal.

Unbaked—Batter may be poured into paper baking cups in muffin pan; when frozen, remove paper cups, pack in folding waxed carton, label carton, over-wrap with moistureproof Cellophane, and heat-seal.

If bulk batter is frozen, pour into containers the same as cake batter.

COOKIES

Baked—Pack in folding waxed cartons, the same as cup cakes.

Unbaked—Bulk dough may be packaged the same as bulk bread dough. If the dough is the refrigerator type which can be rolled and sliced, the rolls may be shaped, then wrapped in moistureproof Cellophane, packed in folding waxed cartons, labeled, over-wrapped with moistureproof Cellophane, and heat-sealed.

PIES

Baked—After baking and cooling, slip the pie into a paper pie plate, and for top protection invert a paper pie plate over the pie, then wrap in moistureproof Cellophane and slip into stockinette (the same as a roast), tie securely, and label.

Unbaked—Paper "Bake-a-Pie" plates are available for this purpose in which the pie is made and also baked after storage. Place the unbaked pie in folding waxed cartons of suitable size, label carton, and over-wrap with moistureproof Cellophane, then heat-seal package.

STEWS, A LA KING DISHES, SPAGHETTI, ETC.

Pack into cup- or tub-shaped containers, or cubical containers such as are used for freezing fruits. The quart sizes will probably be more suitable than pints.

COOKED STEAKS, CHOPS

Package in cartons same as fresh product, covering with gravy.

CASSEROLES

Wrap in moistureproof Cellophane, slip into stockinette, tie securely and label.

SOUPS

Pour into any water-tight, moisture-vaporproof container such as is used for freezing fruits.

POTATOES

Candied Sweets, French Fried, Cottage Fried, Chips—Pack in folding waxed carton lined with moistureproof Cellophane, label carton, overwrap with moistureproof Cellophane, and heat-seal. Or these products may be packaged in laminated foil bags, then heat-sealed.

Length of Storage

During storage, emulsions have a tendency to break down or curdle; in the same manner gravies sometimes separate and deteriorate during storage.

After long storage, some shellfish products such as lobster become tough and rubbery. This is explained by the fact that the proteins in these foods become denatured. However, such changes are not noticeable during short storage periods.

If pork is added to a prepared dish, such as pork and beans, the cooked food cannot be stored long, for the fat in the pork will turn rancid and give an undesirable change in flavor to the cooked product.

Freezing does not kill yeast in unbaked doughs, although over a long period of storage it may weaken it.

Following are the recommended periods of storage for various cooked foods:

Bread, Rolls (Baked)	12 Mo.
(Unbaked)	1 "
Muffins (Baked)	6 "
(Unbaked)	2 Weeks
Butter Cakes, Cupcakes (Baked)	6 Mo.
(Unbaked)	2 Weeks
Angel, Sponge Cakes	6 Mo.
Cookies (Baked)	6 "
(Unbaked)	3 "
Fruit Pies (Baked)	6 "
(Unbaked)	2 "
Cream Pies (Baked)	6 "
(Unbaked)	2 "
Meat Pies (Baked)	6 "
Stews, etc.	6 "
Pork and Beans	6 "
Soups	6 "
Lobster, Shrimp, Crabmeat	1 "
French, Cottage Fried Potatoes	3 "
Potato Chips	6 "
Cooked Steaks, Chops	6 Weeks

Thawing and Heating Suggestions

Thaw all baked goods with the wrapping intact, whether they are heated or just warmed to room temperature, to keep moisture from collecting on outside of food.

Unbaked yeast doughs should be thawed in the package, then shaped or placed in baking pans as the case may be and let stand at room temperature to rise before placing in the oven to bake.

Cake and muffin batters should be thawed in the package, then poured into pans for baking and baked immediately.

When cookie dough is shaped before freezing, it need not be thawed before baking, but may be placed directly in the oven after removing from package.

Unbaked frozen pies need not be thawed prior to baking; simply remove from packaging and bake in the usual manner.

If prepared dishes can be taken out of their containers,

they can be thawed and heated to serving temperature in one operation in the oven, or in a double boiler or saucepan. Stir contents frequently during thawing and reheating over direct heat.

Cooked foods packaged in laminated foil wrapping, such as steaks and chops, need not be removed from the package, but may be thawed and heated in the oven to serving temperature right in the foil.

Soups need not be thawed before heating if they can be removed from their containers.

Thaw cooked shellfish in the package and plan to serve or use them when the product is just thawed, especially if the frozen shellfish is to be used as cocktails or salads. Under no circumstances allow them to remain thawed for any length of time before using them, for they will keep only as long as cooked shellfish which have not been frozen.

Do Not Refreeze

Do not attempt to refreeze cooked foods once they are thawed. Always use them immediately after thawing or within a short time after.

A Word About Left-Overs

Left-over foods from the table can be put in containers and stored in the freezer for as long as a month without deterioration.

Chapter IX

WHEN FOODS COME OUT OF THE FREEZER

When your own storehouse—the home freezer—is bulging with good food, *then* is when a sense of well-being and joyous satisfaction permeates the entire household. This deep inner pleasure is inescapable, as all families having freezing facilities will discover, for no two things give us as much a sense of security as a steady income and food in the house—plenty of it. Then all to-morrows take care of themselves, come what may.

Frozen foods in the freezer are appreciated by the homemaker for still another reason: they represent so many packages of ready-to-cook foods which take an absolute minimum of effort and preparation to be ready to serve at mealtime. Tedious as meal preparation sometimes is, and busy as all homemakers are, the preparing of meals is one of those most important home functions which is very apt to be neglected. Not willingly, of course, but because of the time involved. Take spinach for instance; 15 or 20 minutes can easily be spent in washing greens and picking over leaves. If more than one fresh vegetable is to be served, preparation for dinner must be started early. With frozen foods in the freezer, it is quick and simple to serve any or as many vegetables as you wish to make the meal a good one.

While thawing of frozen foods takes time, it doesn't involve *any of your time* . . . just the thought beforehand

about what foods you wish to serve from the freezer, and putting them out in the place where they will thaw. The most obvious place for this is, of course, out on your kitchen work table where they will thaw in a few hours at room temperature. But an electric fan, and the oven of your range can also be utilized to hasten the thawing of those foods which need to be thawed before being cooked. So even the thawing of frozen foods can be made to work to your convenience.

What foods need to be completely thawed before cooking—how is it best to thaw them—how should they be cooked so as to conserve all the goodness freezing preservation kept there? Here are the answers to those questions:

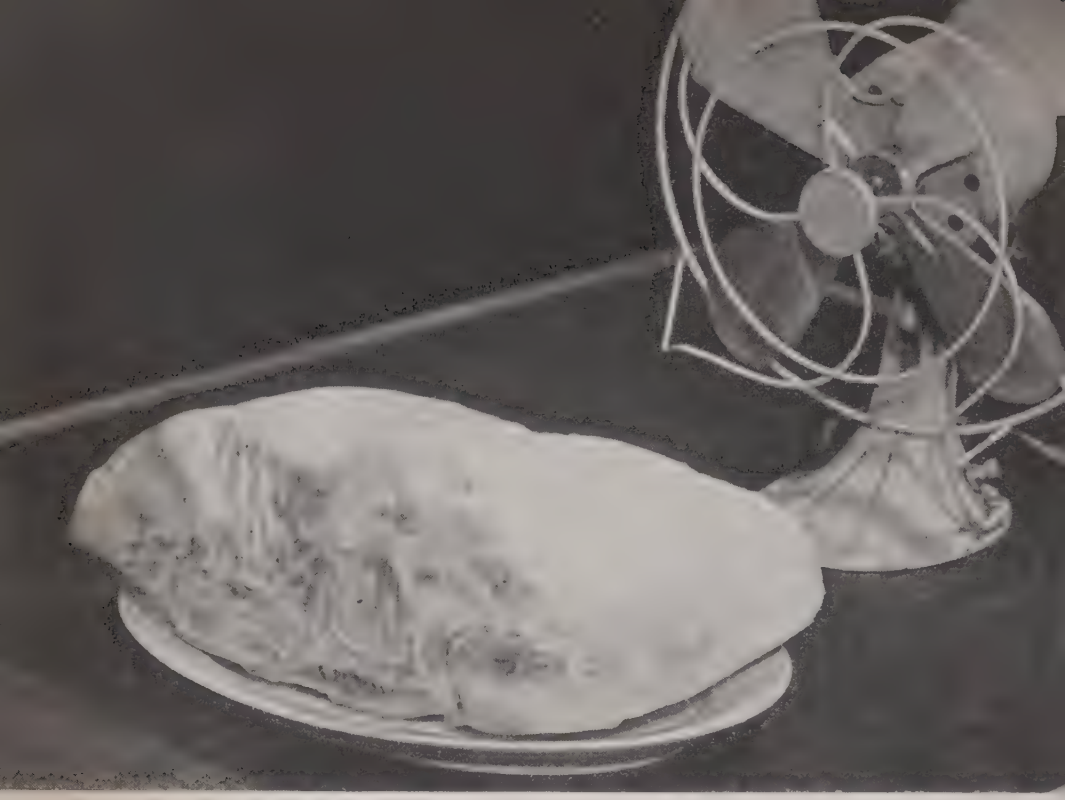
Vegetable Thawing and Cookery

It is recommended that vegetables be cooked in the solidly frozen state; but they may be partially or completely thawed before cooking. *Always thaw ALL frozen foods in the sealed package!* And *never* allow them to stand around after thawing, for they show greater shrinkage and will not put in an appearance at the table in their most attractive form.

The secret of good vegetable cookery is to cook them as quickly as possible. So any procedure that will hasten the cooking of your frozen vegetables is good procedure. Have water boiling before vegetables are placed in the utensil for cooking; start the cooking over high heat so the vegetables will be brought to the boiling point as quickly as possible; and also to hasten the cooking procedure, you may break up the frozen pack before placing it in the cooking vessel by hitting the package sharply against the edge of a table or work surface.

Packages of frozen fruit may be thawed in refrigerator, on kitchen work surface standing at room temperature, or running cold water may be used to hasten thawing of fruits. Place cartons in shallow pan.

It takes more time to thaw foods in the refrigerator, but research has proven that the slower methods of thawing are best for fish and meat products. Place meat for thawing on lowest shelf of refrigerator.



Illustrating means of speeding the thawing of meats. In case of emergency, either method above or b
may be used to reduce considerably thawing time of large pieces of meats. A frozen roast placed in
of an electric fan (above) takes 45 minutes per pound to thaw; in the oven (below), 25 minutes per po

Corn on the cob is the only vegetable which should be completely thawed before being cooked. If it is cooked for the recommended length of time while still in the frozen condition, the cob will still be icy when served at table; and if cooked until the cob is thoroughly heated through, the kernels will be overcooked and much of the fine flavor will be lost.

Spinach and other greens are also better if they are partially thawed or completely thawed before being cooked. It results in more uniform cooking since these vegetables require very short cooking periods.

Oftentimes it is impossible to cook brine pack vegetables while still frozen because they may have to be completely thawed before the vegetables can be removed from the package. In cooking brine pack vegetables, *always* use the brine in which they are packed as the liquid for cooking, add more salt if so desired, but do not add more water unless the vegetables cook dry. Also *serve the liquid with the cooked vegetable* otherwise the water-soluble nutrients (Chapter V) will be lost if not utilized in some manner. As previously stated, this is one of the reasons why brine pack for vegetables is not so highly recommended.

If frozen storage facilities are not at home, you may wish to limit the trips to the locker plant by bringing several packages of vegetables home at one time. Vegetables can be kept in the ice-cube compartment of your refrigerator at home for from 5 to 7 days without undue harm to their quality. But do not allow frozen packages to thaw unless they are to be used at the next meal because spoilage sets in rather rapidly after the vegetables have completely thawed. Neither should completely thawed frozen vegetables be refrozen (for detailed information refer to pp. 25 to 27).

To Boil: Since vegetables are blanched during their preparation for freezing, in a measure they can be termed partially precooked foods and so need much shorter cooking periods than fresh vegetables. This fact is often overlooked, resulting in overcooking frozen vegetables. The time required to cook frozen vegetables is often only half to two-thirds as long as fresh; in the case of such vegetables as beets and squash which are well cooked before freezing, they are only heated to serving temperature.

Habits of long standing are persistent and hard to break; and one of these is the habit of cooking any vegetable, whether frozen or fresh, for such a long time that the "life" is cooked out of it. The longer you cook vegetables the less color, flavor, and nutrients remain in the vegetable. So the most important thing to know about cooking frozen vegetables is to cook them for the shortest possible time and only until the vegetable is tender. Time your cooking, also, so the vegetables can be served immediately; nutrients are lost if they are allowed to stand for any length of time before they are eaten.

In cooking frozen vegetables, use the smallest amount of water possible without scorching or burning, so that when the vegetable is done the small amount of remaining liquid may be spooned up with the vegetable servings. Usually from $^1/_4$ to $^1/_2$ cup of water is sufficient for cooking most vegetables. In the case of home-frozen greens, enough water clings to the leaves for cooking purposes so that no additional water need be added; but in using some commercial brands of spinach and other greens, it may be advisable to use as much as one-fourth cup of water per pint package.

Have the water boiling—a fast, rolling boil—before the vegetable is added; then bring the water back to boiling again as quickly as possible; after water comes to a full

rolling boil with the vegetables added, reduce heat and let the water boil gently the rest of the cooking period. Just after the vegetables start steaming briskly, break up any frozen portions of the pack with a fork. Count the actual cooking time from the time when the vegetables are completely thawed in the cooking vessel and the water starts to boil after they have been added. Seasonings may be added at any time during the cooking period.

To give you an idea of the shorter cooking time required to cook frozen vegetables, here is a cooking time chart which may be used as a guide for all the more common vegetables:

VEGETABLE COOKING TIME CHART*

Asparagus..... 5– 8 min.	Kale.....20–25 min.
Beans, green.....12–15 min.	Kohlrabi..... 8–10 min.
Beans, lima.....16–20 min.	Mushrooms.....10–15 min.
Beans, wax.....12–15 min.	(Sauté—do not cook in water)
Broccoli..... 5– 7 min.	Mustard greens.....12–15 min.
Beets, whole.....18–20 min.	Peas..... 6– 8 min.
Beets, cubed or sliced.....	Rhubarb.....10–12 min.
.....Heat to serving temperature	Spinach..... 4– 6 min.
Beet greens.....10–12 min.	Squash, summer.....10–12 min.
Brussel sprouts..... 3– 4 min.	Squash, winter.....
Carrots..... 5–10 min.	.....Heat to serving temperature
Cauliflower..... 5– 8 min.	Swiss chard..... 8–10 min.
Corn, kernel..... 3– 4 min.	Turnips.....12–15 min.
Corn, on cob..... 3– 4 min.	Turnip greens.....15–20 min.

*Cooking times for vegetables can merely be a guide because they will vary according to the variety of the vegetable, the maturity, size of pieces, etc.

Frozen vegetables may also be cooked in a pressure saucepan. For best results, defrost frozen vegetables in the package at room temperature for one hour, or until the vegetables may be separated. (Allow a longer defrosting time of from $1^1/_2$ to 2 hours for corn on the cob.) Then break the vegetables apart with a fork and put them in a pressure saucepan containing a small amount of water

(about one-half inch) previously heated to boiling. Put cover in place. Begin timing when full pressure is reached. Only a very short cooking time is required when vegetables are cooked in a pressure saucepan; cooking times for some of the more common vegetables are: asparagus cuts, $1^1/_2$ min.; green beans, $1^1/_2$ to 2 min.; broccoli, $1^1/_2$ to 2 min.; Brussels sprouts, 1 to $1^1/_2$ min.; carrots and peas, 1 to $1^1/_2$ min.; cauliflower, $^1/_2$ min.; corn on the cob, $2^1/_2$ to 3 min.; cut corn, $^1/_2$ to 1 min.; peas, $^1/_2$ to 1 min.; spinach, $^1/_2$ to 1 min.

The fact that boiling vegetables is not the only way to prepare them is often overlooked by the busy homemaker; they may be oven cooked, pan fried, deep-fat fried, and prepared in any number of delicious, tempting dishes. Try some of the following suggestions for cooking your frozen vegetables:

Oven Cooking: Frozen corn on the cob is delicious when roasted for about 20 minutes in an oven at 400° F. After thawing, the ears are brushed with melted butter and roasted until done and slightly browned. The heat of the oven dries the corn so that it is less water-soaked than when cooked by other methods. Asparagus, peas, and many other vegetables may be placed in a buttered casserole with butter and seasonings added, and the covered casserole placed in a 350° F. oven. Asparagus requires about 30 minutes to bake; peas, 14 minutes.

Pan Frying: For pan frying, the frozen vegetable is added to about 2 tbsp. of melted fat in a heavy frying pan. Salt is then added, the pan covered, and the vegetable cooked over moderate heat until done. At about 2-minute intervals, the cover should be lifted and the vegetable stirred. Corn and cut-up asparagus are particularly good cooked this way.

Deep-Fat Frying: Corn on the cob is excellent when fried in deep fat. Cauliflower and asparagus are also delicious when dipped in a thin batter and fried in deep fat. The vegetables should first be boiled or steamed.

Other Cooking Suggestions: Cooked frozen vegetables, like cooked

fresh vegetables, may be served as creamed vegetables, souffles, fritters, timbales, casserole dishes, chop sueys, and salads. The directions for using the cooked frozen vegetable in these dishes are the same as for using the corresponding cooked fresh vegetables.

Serving and Using Frozen Fruits

Dessert Serving: All fruits darken and lose flavor rapidly once they are thawed and removed from the package, which fact more or less determines the way of best handling frozen fruits when they are taken from storage.

After removal from storage, packages may be thawed one of several ways: on the lower shelf of your refrigerator, which takes from 5 or 6 hours to about 10 hours (the shorter thawing time for partial thawing); at ordinary room temperature on the work table, which takes from 3 to 4 hours; at ordinary room temperature with the package placed before an electric fan, which takes only about 1 hour; water-tight packages may be placed in a pan of cool water or under running cold water, which takes about 40 to 45 minutes; or water-tight packages may be thawed under running lukewarm water for about five minutes, then transferred to cold running water and a package will thaw in about 30 minutes. It is advised *never* to thaw fruits by immersing the package in hot water. And *always* thaw fruits in the unopened package; never open package and let fruit be exposed to the air during thawing. The thawing times given above are for 1-pound (pint) packages; larger size family packages will, of course, take longer to thaw.

When serving fruits as dessert, let them make a stage entrance to the table by allowing none of their goodness or beauty to slip away before they are eaten. To do this, open package only when you are ready to serve them; and serve while there are still a few ice crystals glistening in the fruit.

Cooking with Frozen Fruits: Frozen fruits may be used the same as fresh fruits, in preparing pies and other dishes for the table: upside-down cakes, cobblers, muffins, fruit whips, souffles, ice creams, sherbets, ices, and salads as well as preserves, jellies, and jams. In fact some of the small fruits such as raspberries, strawberries, cranberries, Youngberries, and Boysenberries make better jellies when frozen than when fresh because freezing and thawing cause the juices to be released from the cells and the natural fruit color dissolves in the juice.

One important factor to keep in mind when cooking with frozen fruits is to make allowance for any sugar which has been added to the fruit at the time of freezing. When they are used for pies, usually no additional sweetening is needed, but the juice of berries may require some thickening. Preserves, jams, and jellies will need more sugar to make the total amount equal to that called for in a recipe given for fresh fruit.

Frozen Meat Cookery

The cooking of frozen meats does not present the problem that thawing of them does, because when meats are completely thawed, they are cooked and treated just like fresh meats with one exception—thawed meats should not be held for any great length of time before cooking.

Like all other frozen products, meat should be thawed with the original packaging intact, for it would be bad practice to allow meat to stand exposed to the air.

It takes time to thaw meats, especially the heavier pieces. Standing at room temperature it will take about 2 hours per pound to thaw meat—5 hours per pound if placed on a shelf of the refrigerator. However, thawing can be speeded up by using an electric fan or a warm oven (200° to 250° F.). If the frozen meat is placed in front

of an electric fan at room temperature, thawing time can be cut to only 45 minutes per pound. If it is placed in a warm oven it takes but 25 minutes per pound to thaw.

There is a greater amount of drip from meats which are thawed rapidly, so whenever possible you may wish to plan to use your frozen meats far enough in advance to allow for slower thawing. A convenient way to thaw a roast slowly is to place it on the lower shelf of the refrigerator the night before you plan to serve it. If it is a 3- or 4-pound roast, or smaller, it will be thawed sufficiently to cook the next day. If it is larger, remove it from the refrigerator several hours before cooking time and let it complete thawing at room temperature.

Although almost any meat may be cooked while still partially or solidly frozen, it is generally recommended that thawed or almost thawed meats be used for roasting since a more uniform doneness can be obtained. When roasts are cooked in the solidly frozen state, it not only takes a very long time to cook the roast, but when the outside is nicely browned the inside is likely to be raw and cold because heat penetrates slowly. Thin steaks and chops may be cooked without being thawed, but steaks which are $1^1/_2$ inches or over in thickness should at least be partially thawed before cooking. It is also better that ground meats and the variety meats (liver, etc.) be completely thawed before cooking.

If any meat is cooked without being completely thawed, additional cooking time must be allowed and the temperature should be lower than when cooking the corresponding fresh or completely thawed meats so that there is gradual heating and complete defrosting during the cooking period. Use a recommended meat cooking chart for accurate times and temperatures for cooking completely thawed meats; add from 12 to 20 minutes more per pound to the

time given for roasting meats which are still frozen; add from 13 to 23 extra minutes per pound for broiling thick solidly frozen steaks.

When cooking meats which are still frozen, it will be especially beneficial to use a meat thermometer to get exactly the degree of doneness desired—it is the only way to eliminate the guesswork when cooking any meat in order to get it rare, medium, or well done. Since it is almost physically impossible to insert a meat thermometer deep into the center of a piece of frozen meat, we suggest inserting the thermometer when the meat is about half cooked, when it has thawed sufficiently to easily insert the thermometer. Then, if any difficulty is experienced with getting the thermometer into place, make a hole with a metal skewer (or some similar metal object) into which the stem of the thermometer can be inserted. In any event, take care not to break the thermometer while attempting to insert it.

Before passing on to the thawing and cooking of other frozen products, perhaps you would like to review the latest methods of meat cookery which give the best flavors, less meat shrinkage, etc.

Roasting: A roast at least 5 inches thick is best. Rub surfaces with salt, or salt and flour if desired. Place fat side up in an open shallow pan, on a rack or trivet if it is boneless, and roast uncovered. Lean roasts may be larded or pieces of suet may be placed on top. *Add no water and cook at a constant moderate temperature.* It is not necessary to first sear the meat, although this may be done if preferred. Oven temperature for beef and lamb: 300° F.; for pork: 350° F.; for chicken: 325° F. Keep the oven temperature constantly at these levels throughout the roasting period because (1) it gets uniformly done; (2) bones and fat are not charred; (3) there is less shrink-

age, resulting in a plump, full roast; (4) the meat is more flavorful and juicy; (5) it requires less watching by the cook; (6) the oven does not get grease spattered. Roasting in this way does not require basting; if the fat side of the roast is up, or if it is larded or topped with suet the roast will be self-basting. The time for cooking a roast cannot actually be given in hours and minutes because cuts will vary in weight, shape and composition; and the temperature of the meat when it is placed in the oven also affects the length of time necessary for roasting. As mentioned previously, a meat thermometer is the only sure way to arrive at the degree of doneness required. Thermometer readings for degree of doneness are as follows: Beef, rare—140° F.; beef, medium-rare—160° F.; beef, well-done—170° F.; lamb, medium—175° F.; lamb, well-done—180° F.; pork, which should always be cooked to the well-done stage—185° F.

Oven Broiling: Prepare the broiler by rubbing it with fat and preheating it for 10 minutes at 350° F. Slash edges of fat several places around pieces to prevent curling during cooking. Rack is placed in broiling position so that top of meat is three inches from the source of heat for 2-inch steaks or chops, or two inches for 1-inch thicknesses. To determine degree of doneness desired, a meat thermometer may be inserted horizontally into the center of the largest muscle of one of the pieces. As the meat is nicely browned on one side, or the thermometer registers 100° F. for rare beef, or 135° F. for medium beef and for lamb, seasonings are added to the steaks or chops, and they are turned to finish cooking on the other side. You will find that well-done steaks are never as juicy as the medium or rare ones.

Pork and veal usually require a longer, more moist

method of cooking to make them tender, so these meat are not often broiled.

Pan Broiling: Where no oven broiler is available, thi is a good method of dry-heat broiling. Do not add an fat to the skillet, although you may wish to rub it with th fat edge of the meat or a piece of suet before the meat i put into the skillet. Also, pour out the melted fat as it ac cumulates during cooking, leaving just enough to preven the meat from sticking. Brown meat on one side, the turn and brown on the other side; brown the meat o both sides at a high temperature. After browning, reduc temperature and cook until the desired degree of donenes is reached, but do not cover while cooking.

Braising: This is the moist-heat method most ofte used for less tender cuts of meat with liquid added. Th meat is browned on both sides first, either in its own fa or a small amount of fat added; then water, tomato juice meat stock, vegetable cooking water, milk, sweet or sou cream, diluted vinegar, cider, or fruit juices are added; tight-fitting cover is placed over the vessel and the mea is simmered until done. In some cases, the meat may b cooked in its own juices with no liquid added; when liqui is added, only enough should be used to keep the mea from burning. After browning the meat, the cooking tem perature should never be above a low temperature fo simmering.

Stewing: There are two types of stew: brown stew and light stew. To obtain the brown stew, meat i browned before water is added in which the meat is slowl simmered until done. For light stew, the meat is no browned but water just to cover the meat is added at th start. Add seasonings when the meat is put on to cook but add vegetables just long enough before serving tim to insure their being cooked done.

Poultry, Fish, and Shellfish

POULTRY—It is recommended that poultry be completely thawed before cooking for the same reasons given for the thawing of meats, especially poultry for roasting. Thaw broilers and cut-up poultry at least partially, until the pieces can be separated. In case poultry is cooked when not completely thawed, be sure to allow additional cooking time and cook at a lower temperature than when cooking fresh or completely thawed, although all poultry, whether fresh or frozen, is best thoroughly cooked at a moderately low temperature.

Always thaw poultry in the package in which it was frozen. Use the same means to thaw (and hasten thawing) as are recommended for meats: on lower shelf of refrigerator; on work surface at room temperature; on work surface placed before an electric fan; in warm oven (200°–250° F.). Allow 6 to 8 hours for thawing of poultry of about 3 pounds in the refrigerator. Larger size birds require a somewhat shorter time per pound for thawing. Similarly to meat, thawing times are reduced considerably by the electric fan and oven methods. If roasters are stuffed before being frozen, be sure to include the weight of the stuffing in considering thawing time necessary for poultry.

FISH—Thaw fish completely and cook as fresh fish by baking, broiling, pan-frying, deep-fat frying, boiling, or steaming. If fish is only partially thawed, it requires slower and longer cooking periods and is more likely to stick to the pan if dry heat methods are used. Slow thawing in the package on a lower shelf of the refrigerator is the best method for defrosting; however, fish may also be placed unopened on a work surface at room temperature or in front of an electric fan at room temperature; both

procedures, of course, accelerate thawing. A 1-pound package requires from 6 to 10 hours in the refrigerator, about 3 hours at room temperature; and about 2 hours in front of an electric fan. Fish should be cooked while still chilled because it will spoil as readily as fresh fish.

SHELLFISH—Crabs, lobsters, and sometimes shrimp are cooked until done before they are frozen. In such cases they must be completely thawed for use in cocktails, salads, and the like. However, in cooked dishes, such as lobster Newburg or shrimp Creole, the product need be only partially thawed so the pieces can be broken apart and mixed with the other ingredients of the dish; being small they will completely thaw and heat through quickly during the cooking period.

All other shellfish which are not cooked prior to freezing should be completely thawed before using in cooked dishes or served as a cocktail. However, serve or use them while still chilled; never allow them to warm to room temperature.

Cooking with Frozen Dairy Products

EGGS—If individual eggs are frozen for poaching or frying as described on p. 159, they need not be thawed prior to cooking, but are taken out of their wrapping and slipped into simmering poaching water or into a skillet over low heat for frying in their solidly frozen state. They will take a little while longer to cook than fresh eggs, but the low heat or simmering cooks them slowly enough to thaw during the cooking procedure.

Frozen eggs to be used in baking must be thawed before they are used. Thaw them in the refrigerator, or at room temperature, always in the unopened package. If packages are made small for cooking purposes when they are frozen, thawing presents no problem—about a half hour

at room temperature is sufficient to thaw small quantities.

Frozen eggs should be used while they are still chilled, particularly when yolks are frozen separately.

Frozen egg whites can be used in the same manner for cooking purposes as one would use fresh egg whites. They make just as good meringues, frostings, and angel cakes as fresh egg whites do.

When whole eggs are frozen, or the yolks frozen separately sugar, corn syrup, or salt is added before freezing (page 158), so these products cannot be used in all recipes. When sweetening has been added, allowance for the amount added at time of freezing should be made when using them in a recipe. Egg yolks which have been sweetened should never be used for making mayonnaise or salad dressings, or sauces such as Hollandaise or Marguery. Yolks to which salt has been added should be used for making mayonnaise or salad dressings; and make allowances in your recipe for the amount of salt added at the time of freezing.

OTHER DAIRY FOODS—Milk, butter, cream, and cheese should always be thawed completely in the unopened package (in refrigerator or at room temperature) and then used in the same manner as one would use the fresh, except cream (see p. 159).

Thawing and Serving Cooked Foods

Cooked foods such as a la King dishes, stews, hashes, soups, meat dishes, etc., need not be thawed if they can be removed from their packaging while still in the solidly frozen state, otherwise they must be thawed partially so as to remove the contents of the package to put the food in the utensil for heating. Frozen cooked foods are heated only to serving temperature preferably in a double boiler, stirring frequently. Be careful not to overcook the food

in heating it, for it is liable to become mushy and shapeless. Plan to serve frozen cooked foods as soon as they are heated to serving temperature.

Thawing and Cooking Baked Goods

BREAD, BISCUITS, ROLLS—Recommendations for freezing these items baked or unbaked are given on pages 167–171. If bread, biscuits, and rolls are frozen unbaked, thaw them completely in the unopened package, then let them raise and bake as fresh goods. If they are baked before being frozen, thaw them in the unopened package by letting them stand at room temperature. Bread and rolls thaw very quickly as the moisture content of the finished baked product is very low. A loaf of bread, standing at room temperature, will thaw in about 30 minutes. If you desire to serve rolls or biscuits hot, place them in a moderate oven (350° F.) with the packaging intact, and let them thaw and heat through simultaneously. To heat rolls or biscuits to serving temperature takes only about 15 or 20 minutes. Bread, in its original wrapping, may also be warmed for serving. Keeping baked goods in their wrappings until they are thawed or warmed up not only prevents loss of moisture from the product but keeps moisture in the air from collecting on the outside of the product which happens when a cold surface is exposed to room temperature (you have noticed how a glass of ice water collects moisture on the outside when standing on the table).

PIES—If pies are frozen unbaked, they can be slipped into the oven for baking when they are solidly frozen or partially thawed; bake them as you would the corresponding fresh pie, allowing a few additional minutes in the baking period.

Pies that are frozen already baked can be warmed for

serving, or served when the pie has thawed to room temperature, and should always be thawed in the package. If pies are to be warmed, place them in a moderate oven for about 20 to 30 minutes.

CAKES AND COOKIES—Either the baked products or the batter or dough should be thawed completely before being used. They will thaw very quickly at room temperature. Bake the batter or dough as you would the fresh. The baked cakes, cup cakes, or cookies should be thawed in the unopened package because all baked goods will collect moisture if exposed to the air, making them soggy.

Chapter X

ICE CREAM IN THE FREEZER, TOO!

Drug stores now quote prices on ice cream by the gallo and two and one-half gallon containers as well as by pint and quarts—on cones by the package instead of only one— on one-half gallon jugs of syrups and flavorings instead o single servings. One of the first discoveries a famil makes about a home freezer is how good it keeps ice crean and the thrill of having it there—always on hand to enjo at any time for any occasion, to serve in cone or dish.

Ice cream for your freezer can be purchased in quantit from your druggist at quite a saving over small purchases or you can make it yourself at home in an ice cream freeze or the household refrigerator, although refrigerator ic cream doesn't quite measure up to that made in an ic cream freezer, you will have to agree.

This chapter is devoted to the good old-fashioned cran freezer kind of home-made goodness that has more or les been relegated to the limbo of almost forgotten childhoo memories. Maybe the old ice cream freezer was put up o the top shelf of the cupboard or back in the corner of th store-room because it took time and trouble to make i first of all, then it had to undergo hardening with anothe ice and salt pack, and finally when it was opened it had t be consumed with great gusto before it melted to mush But with a home freezer, you simply make the ice crean pour it into moisture-vaporproof containers such as ar used for freezing fruits, then store it in the freezer when it's ready to serve any time of the day, any day thereafte

va Fruit, a delectable frozen fruit dessert, is made from sweetened fruit purée and gelatin. Illustrated is purple raspberry purée being added to dissolved gelatin preparatory to freezing. Directions, page 197.

nished Velva Fruit is mouth-watering to see as it is spooned from freezer. It may be eaten when frozen, or packed in freezing containers and stored in the freezer for later use. Many fruit purées may be used.

It is easy to make ribbon, or variegated, ice cream. Freeze vanilla cream and pour "ribbons" of sa
fruit purée through cream as freezing container is filled. Then allow to harden in home freeze

Molded ice cream out of the home freezer for special events and parties! Any of the gelatin molds—la
the small individual ones—may be utilized for this purpose if regular ice cream molds are not availa

So if that old crank freezer is still around, get it out and see how easy it is to make truly delicious ice creams at home when it can be stored in your home freezer until you want it. Or, if you do not own a freezer, you may wish to invest in one of the new electric ice cream freezers which take the arm work out of making ice cream.

The fruit purées which are described in detail on pp. 144–145 go hand in glove with ice cream in your freezer. They can be used not only to dress up your ice cream into sundaes, but to make "ribbon" ice cream out of plain vanilla as well. By themselves, they also make a frozen dessert called "Velva Fruit" that—as its name implies—is the smoothest bit of deliciousness ever melted in your mouth. Velva Fruit has a not-too-sweet, true fruit flavor that is simply delicious.

There is no limit to the kind of ice creams, sherbets, ices, and Velva Fruits you can freeze. For fruit sherbets and ices you can use your favorite recipes. Given below are basic recipes and variations for the custard type and the cream type of vanilla ice cream.

Ice cream, or any other frozen dessert made in the crank freezer, may be packaged in any of the tub- or cup-shaped containers used for freezing foods. In most instances the pint or quart sizes will be the more practical. However, if your freezer is large enough, ice cream can be put into a gallon size container for storage and scooped out for serving with a regular ice cream scoop.

Ice cream can also be frozen in molds for special occasions. Use either the individual or large molds for this purpose which you use to make molded gelatin dishes. When the ice cream is made, fill the molds to overflowing, cover with waxed paper, and place in the freezer to set. If they are not to be served within a day or two, package the molded ice cream for storage by wrapping the large

molds in moistureproof Cellophane and heat-seal the package; pack individual molds in a waxed folding carton (large size such as is used for steaks, etc.), over-wrapping the carton with moistureproof Cellophane and heat-sealing the package. Ice cream molds may be turned out of the molds before being packaged if desired; to turn out ice cream molds, dip mold in warm water for a few seconds as you would a gelatin mold, but be certain to use warm, not hot, water for turning out ice cream molds.

Custard Type Ice Cream

1 qt. milk, scalded
1 tbsp. cornstarch
1 cup sugar
1 egg, beaten
2 tsp. vanilla
Few grains salt
1 pt. heavy cream

Procedure: Mix sugar and cornstarch well, add to scalded milk slowly, stirring milk while adding. Cook 15 to 20 minutes in double boiler. Beat egg, pour small amount of hot milk mixture over beaten egg, stirring well. Add egg to milk mixture and cook 3 to 5 minutes. Cool; then add vanilla and cream; place in ice cream freezer, and freeze. Makes 2 to 2 1/2 qts. ice cream. Two eggs may be used in this recipe, omitting the cornstarch.

To make a quantity of ice cream for storage, use the following ingredients with procedure as described above: 6 qts. milk, scalded; 3 lbs. sugar; 6 tbsp. cornstarch; 1 tsp. salt; 6 eggs; 4 tbsp. vanilla; 3 qts. heavy cream. This makes about 3 to 3 1/2 gallons of ice cream and may have to be divided for freezing, unless yours is a large 5-gallon freezer.

Cream Type Ice Cream

1 qt. light cream
3/4 cup sugar
1 1/2 tsp. vanilla
Few grains salt

Procedure: Scald cream, then cool; add sugar, salt, and vanilla; place in freezer, and freeze. Makes approximately 1 1/2 qts. ice cream.

Follow procedure above for the quantity ingredients given here: 4 qts. milk, scalded with 5 qts. heavy cream; 6 lbs. sugar; 4 tbsp. vanilla; 1 tsp. salt. This makes about 3 gallons of ice cream.

ICE CREAM VARIATIONS

The amounts given are for small, not quantity, recipes.

Chocolate—Beat 3 sq. melted unsweetened chocolate into custard before folding in cream.

Coffee—Scald 1/3 cup coffee with milk before adding other ingredients.

Strawberry—Add 1 to 2 qts. fresh strawberries (washed, crushed, and sweetened) or 1 pint of frozen sliced strawberries to freezer mixture just before freezing.

Pistachio—Add 1 tsp. almond extract and small amount green food coloring to tint ice cream a delicate pistachio green. Chopped pistachio nuts may also be added.

Maple Nut—Substitute maple syrup for the sugar in either recipe and add 1 cup chopped nuts.

Butter Pecan—Toast 1/2 cup broken pecan meats in 2 tbsp. butter in skillet for about 10 min. Add to freezer mixture just before freezing.

Banana—Add 1 cup sieved bananas and 1/4 cup lemon juice to freezer mixture just before freezing.

Peppermint Stick—Add 1 lb. red-and-white peppermint candy, crushed, to scalded milk when making freezer mixture.

Macaroon—Add 1 cup rolled macaroons to freezer mixture before freezing.

Date, Nut, Cherry—Add 1/2 cup pitted, chopped dates; 1/2 cup chopped Maraschino cherries; and 1 cup chopped nuts to freezer mixture just before freezing.

Cantaloupe—Add 2 cups cantaloupe pulp (put through food chopper) and juice of 1 lemon to freezer mixture just before freezing.

In making ice cream, be sure to use the right proportions of ice cream salt and ice in the freezer, otherwise freezing will take place very slowly. One part of salt to each 3 or 4 parts of ice is best. Also start with a cool mixture, since a warm mixture may turn to butter or result in a coarse texture, and turn crank slowly at first until there is some resistance against the dasher showing the freezer mixture has started to thicken, then turn crank rapidly until the cream is frozen.

To Make Ribbon Ice Cream

Either fresh fruit purée or the frozen product (preparation instructions on page 144) may be used. If frozen is used, thaw the purée by putting the sealed container in cold or lukewarm water (not hot) for about 20 to 40 minutes. Pour the purée in "ribbons" through the ice cream as you fill the containers with ice cream from the crank freezer. This can be done in one of two ways: by pouring the purée in a thin stream simultaneously with the ice cream into the container; or by filling the container half full of ice cream, adding a generous portion of purée, then filling the container to the top with ice cream getting the ribbon effect by turning a spoon through the contents two or three times.

Chocolate and butterscotch ribbon ice creams may be made in the same way as the fruit ribbon ice creams, using a thick fudge or butterscotch syrup (made previously and chilled) instead of the fruit purées.

Fruit Flavored Ice Creams

You will find that the fruit purées give a much finer tasting fruit ice cream than can be made with the fresh mashed product. Any of the following purées may be used: Black or red raspberry, strawberry, loganberry, Boysenberry, dewberry, peach, nectarine, persimmon, apricot, currant, pineapple, grape, plum, cherry, or cranberry.

To make any of these fruit flavored ice creams, simply thaw a container of the desired purée as described under making "Ribbon Ice Cream," and add the contents of the package to the freezer mixture just before freezing.

To Make Velva Fruit

Velva Fruit is a frozen product containing no milk or cream, just the sweetened fruit purée and gelatin. Either the fresh purée or the frozen purée may be used to make it. Thaw the frozen purée as suggested previously before using. The following recipe gives approximately one gallon Velva Fruit:

6 cups fruit purée
1½ to 2 cups sugar (omit sugar if frozen, sweetened purée is used)
2 tbsp. lemon juice (omit for acid fruits)
¼ tsp. salt
2 tbsp. granulated gelatin
½ cup cold water

Procedure: Mix fruit purée, sugar (if fresh, unsweetened purée is used), lemon juice where needed with bland fruit, and salt. Soak gelatin in cold water for 5 minutes, then dissolve by heating over boiling water and add to the fruit purée. Fruit purée should be cool (70° F.) when gelatin is added. If purée is too cold, the gelatin will congeal before mixing thoroughly; if purée is too warm, the mixture will expand too much when whipped in the freezer. Add gelatin slowly to the purée mixture, stirring continuously. Pour into ice cream freezer and freeze (about 20 minutes, or until crank turns hard), using 1 part salt to 4 parts ice.

Velva Fruit may be served as soon as it is frozen or it may be packed in tub- or cup-shaped moisture-vaporproof containers for freezer storage. If stored in freezer before using, place the packages in freezer at once so it won't soften and later form coarse ice crystals.

Suggestions for Serving Ice Cream

It is surprising how many ways you will find to serve ice cream when you have it on hand in the freezer, and how quickly you will come to depend upon its being there in the freezer for in-between meal snacks, to round out dinner and luncheon menus, and to make party fare out of cakes and pies. Hardly a day will go by without the children eating it, or your serving it in one of many, many ways, a few of which are listed here:

As filling for cream puffs, served with hot fudge sauce.

As baked Alaska: Scoop out center from serving of sponge cake, fill with ice cream, top with stiffly beaten meringue, place in hot oven (500° F.) until delicately browned, serve immediately.

As ice cream pie: Fill a baked pie shell with ice cream; completely cover the surface of the ice cream with stiffly beaten meringue (to protect ice cream from melting in the oven); bake in very hot oven (500° F.) for 2 or 3 minutes which should lightly brown meringue; serve immediately.

In "melon balls" heaped in half of cantaloupe, making tiny balls with melon scoop.

As vanilla or chocolate hot maple syrup sundae.

As nut sundae, topping ice cream with toasted, chopped almonds (or any chopped nuts).

In baked tart shells, topped with whipped cream.

As toasted, shredded cocoanut sundae, or crumbled macaroon sundae.

As ice cream cup cakes: Hollow out center of cup cake, fill with ice cream, top with chocolate, butterscotch, or fruit sauce.

As chocolate mint sundae: Sauce is made by melting chocolate mint patties in just enough water to prevent them scorching while melting.

Pie a la mode; cake a la mode.

As honey sundae, topping ice cream with honey and salted nuts.

To dress up fruit cocktail for taste as well as appearance.

Chapter XI

FREEZING WILD GAME MEAT AND FISH

Whether the sport of hunting and fishing spurs interest in freezing, or whether freezing sends more sportsmen to field and stream is indeterminate. But the combination —game foods and freezers—has intensified interest in hunting and fishing to the point where some state wild game commissions are having some headaches. Because when game commission rulings were first laid down to conserve wild life and to give each hunter his fair share of the available game, preserving game foods by freezing them until they were ready to be eaten was unheard of. So in order to make game rulings as foolproof as possible, most game commissions put a time limit on home consumption of game foods as well as a limit on the open season and the quantity which could be bagged. Now that freezing makes possible the preservation of game in excellent condition over a long period of time, many state game rulings are out of step with the modern hunter. Or so many persons who are interested in the sport of rod and reel think, because, they reason, "why must I dispense with my choice catch by eating it, by giving it away, or by throwing it out within 5, 10, 20, or even 30 days after the close of open season?"

The next few years probably will see many changes in game rules to allow the sportsman to bag his limit and keep it in frozen storage until he sees fit to consume it, if he is properly licensed and the game food is properly identified throughout storage. There are already a few

states having no restrictions on the length of time game food can be kept after it is caught during open season: Idaho, Illinois, Montana, Ohio, Oregon, South Carolina, Texas, and Utah. But much confusion seems to reign as to such rulings in most of the other states. In some states there are no regulations concerning how long game foods may be kept after the end of open season—or if they may be kept at all. A few states stipulate that some game (such as deer or elk) may be kept indefinitely if stored in a licensed warehouse; others allow such game to be kept if a special permit is secured from the game commission. Connecticut specifies game may be kept until the opening day of the succeeding season; Indiana, Kentucky, Rhode Island, and West Virginia do not allow hunters to hold their kill after the season has closed. Some states allow as much time as 3, 4, or 6 months after the close of the season for consuming game foods; many states maintain that game foods must be disposed of within 5, 10, or 20 days after the close of open season.

Perhaps the fact that game foods can be frozen so successfully may in some way help to organize the seemingly disorganized state game rulings in this respect to bring about some semblance of uniformity. But, of course, any relaxation of present rulings will be a real test of the code of sportsmen so that such laxity of storage rulings will not breed game "hogs" nor contribute unlawfully to commercial traffic in those few instances where it is permitted in some seasons to sell game foods (e.g., a certain amount of commercialism on rabbits is allowed in the state of Missouri because of their abundance).

To-day's hunter doesn't just hunt for the thrill of the kill. There is as much enjoyment in bringing home and eating the choice delicacies mid family, friends, and tall tales as there is in facing into a biting wind to stalk the

prize. That freezing adds considerably to this phase of hunting and fishing is not to be denied by either the game commissions or the hunter or fisherman.

With this in mind, the sportsman in the field, or the one on deck scanning a troll line for the flash of a silver fin will profit substantially by knowing how to care for his game so he can bring it home in the best condition for good eating. If game is not cared for properly, it will deteriorate so as to be partially or wholly inedible. There are instances where hunters have lost their meat by spoilage the second day after it was bagged. Had it been well taken care of, there is no reason why the meat could not have been in excellent condition for as long as a week, and longer than that in very cold weather.

Field Pointers for Big Game*

Two of the greatest causes of game meat spoilage are souring and flies. The natural ripening of the meat which makes it more tender and juicy, occurs as soon as rigor mortis sets in the animal and is to be both expected and desired. However, there is danger of stinking-sour, commonly described in game as "overheated," which will occur in meat which has not been cooled properly. It is failure to remove quickly the animal's body heat which causes the stinking-sour.

In order to take the best possible care of a carcass, it is well for the hunter to equip himself with the following: a good sheath knife with a 7-inch blade; a can of black pepper; 5 yards or more of cheesecloth; 10 feet or more of rope; and elk hunters will do well to have a belt axe.

As soon as the animal is bagged the throat should be cut

* Much of the information given here on caring for big game in the field was generously contributed by Prof. W. V. Halverson, University of Idaho, who is considered an outstanding authority on the subject of game meat.

so the animal bleeds properly; the testicles removed, and the scent bags just inside the gambrel joint should be cut out. The animal should then be dressed and the carcass laid wide open so that body heat can be removed quickly and the cut surfaces dried to discourage insect attacks.

How to Bleed and Dress: Make certain that animal is dead; approach animal from rear and place knee on its neck; reach across the body and find the soft cavity where neck meets the breast bone and insert the hunting knife at this point, plunging it in as far as it will go so as to reach the main arteries. One insertion of the knife should be sufficient if the knife is worked around well inside the neck and moved sideways in both directions to sever both of the larger blood veins. To stick the carcass for bleeding in this manner is especially desirable if the hide is to be preserved for tanning or mounting.

Dressing the carcass is a problem which must be accomplished according to the size of the carcass and the conditions where the animal is killed. Deer can readily be suspended on a tree, using a gambrel stick and hoisting the carcass as the dressing out progresses. Other and larger carcasses may have to be dressed laid out flat on the ground, but take care to arrange the carcass so that the blood will not run under the hide and soak it. If there is a slight ground incline in the vicinity, lay carcass with head downward to promote bleeding away from carcass. A pile of brush will also facilitate bleeding and cooling of the carcass; if used, it should hold the carcass at least 18 inches off the ground.

The most popular way of cleaning out the carcass is to cut around the rectum first, then make the slit up the underside down through the neck so as to remove the gullet along with the offal. Tie the rectum and remove all organs up to the diaphragm; cut diaphragm free from

ribs making organs inside chest cavity accessible; loosen gullet at neck; reach inside animal until the first cut at the throat arteries is felt, and pull everything away from cavity of carcass. Remove heart and liver carefully from viscera and dispose viscera some distance away from dressed carcass so it will not attract flies or other insects.

On warm days blowflies appear in large numbers as soon as the carcass is opened. If they are permitted to lay their eggs on the warm meat, the meat may be lost to maggots within a few hours. Although any group of hunters is likely to disagree on the method of handling game meat, any one or a combination of the following three procedures will enable the hunter to meet almost any situation he may encounter: (1) Sprinkle black pepper over all the exposed surfaces of meat; (2) cover meat side of carcass with cheesecloth; (3) glaze meat surfaces with blood from the animal. The use of black pepper on exposed surfaces of meat is perhaps the most common procedure to protect the carcass from flies and insects; it should be dusted generously over all meat surfaces and can be used advantageously in combination with the glaze procedure for surfaces which do not glaze readily. To glaze a carcass, save a quart or more of the blood in the body cavity as the animal is dressed; dip the blood up in the cupped hand and smear over all exposed meat surfaces; when dry and coagulated it will leave a hard, glossy skin which the blowfly cannot penetrate. In climates where yellow jacket wasps are numerous, cheesecloth covering the meat surfaces of the carcass will be especially effective. Be sure not to use a heavy cloth when cloaking the meat surfaces of a carcass, as it will not permit radiation of body heat.

It is common practice to remove the legs of carcasses at the knee joints. Hide from deer is seldom removed; but

skinning of any thick-skinned animal such as elk is claimed to be beneficial because it helps cool the carcass. Elk carcasses are most often halved by cutting down the back of the carcass so they will lie wide open. Many hunters also prefer to quarter them immediately before they are taken back to camp.

In the case of large game such as elk when the kill takes place just before dark and it is a long way back to camp, the animal should be completely dressed out, the carcass propped open for thorough cooling and placed on top of a deep brush pile where it can be left until the next day, protecting the meat in the meantime, however, by any of the methods outlined above.

As soon as game is delivered at camp, it should be hung up from a pole so the meat is at least three feet off the ground. A small smudge fire may be maintained under the meat to discourage flies and insects, but there should not be sufficient smoke to smoke the meat. If whole carcasses are hung at camp for several days, they should be hung by the back legs spread well apart so air may circulate freely through the body cavity.

When skinning an animal, it need not be a difficult task, particularly if the carcass can be hung. Cut each hind leg at the knee and along the inside of the leg to the center cut at the body. Loosen the skin around the knee joint with a knife to get the skinning started. By working slowly and carefully, the hide can then be "peeled" down the legs and the entire body. Pull the hide loose right up to where the head joins the neck; insert a knife into the flesh of the neck and cut all around the neck loosening the head, but being careful not to cut the hide. Then, by twisting the head loose from the carcass, both head and hide will come free.

Cutting and Wrapping Big Game

The cutting of large game meat follows the conventional cuts for beef; and, like beef and other domestic animals, it is recommended that the cutting be done by an expert meat cutter either at the locker plant or local meat market.

Special taste treats are in store for the hunter who utilizes all parts of the carcass, rather than merely the usual venison roasts, steaks, or chops. The shanks and neck, ground and mixed with ground pork or ground veal, make excellent meat balls, patties, and meat loaf. The shanks, neck, flank, and brisket will impart a delightful and different flavor if used in stews either alone or in combination with other meats. The liver and heart can be used to make a paté which can then be frozen and stored until the special occasion arises calling for something so fine for appetizers with cocktails.

The accompanying chart shows clearly the conventional cuts for a carcass and to what purpose each portion may be put (see next page).

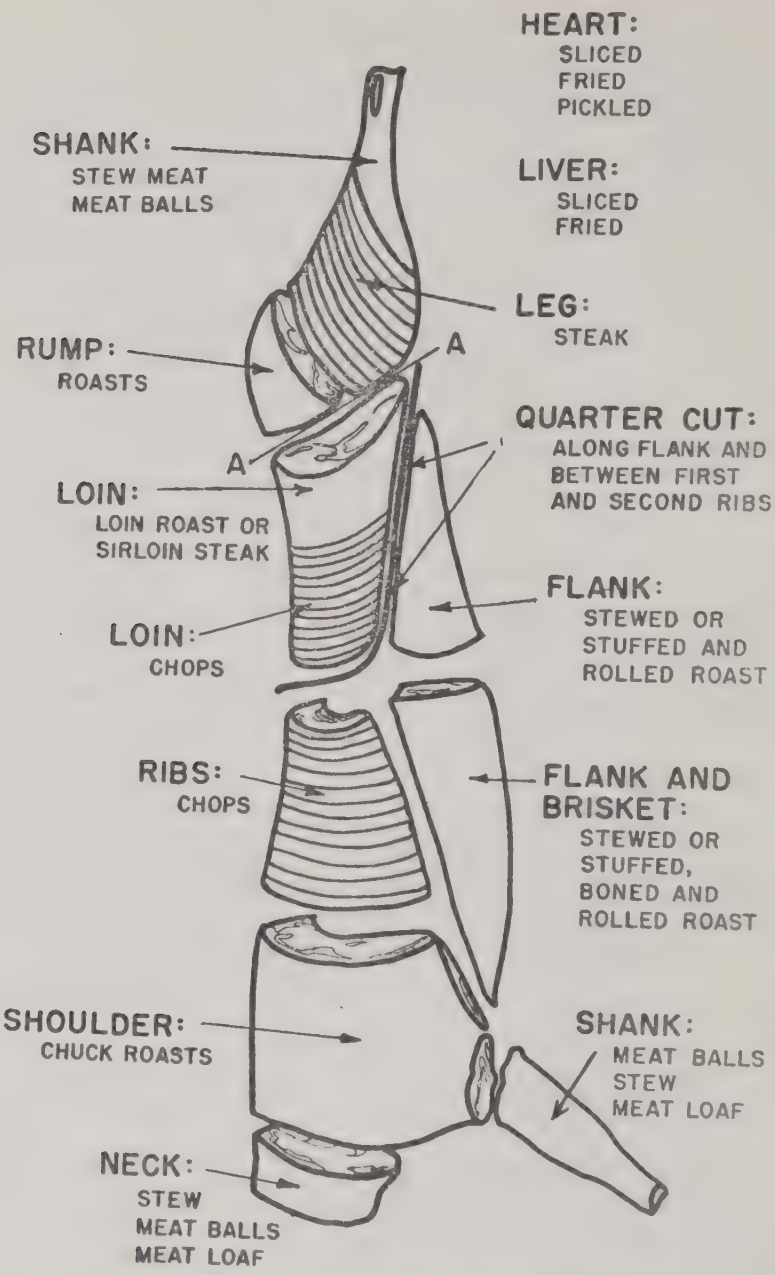
Wrapping game meats for freezing follows the same procedure as for domestic cuts of roasts, steaks or chops, stew meat, ground meat, etc. (See pp. 150–151).

Field Pointers for Small Game

A tastier bird will result if properly bled as soon after killed as possible. This can easily be done right in the field by inserting the point of a sharp knife down the throat and severing the main arteries, then letting the bird hang head down for a few minutes to bleed thoroughly.

Bleed small four-footed game as described for large game; eviscerate and skin also in much the same manner.

Recurrent reports are circulated about some hunters not plucking or dressing birds if they are to be consumed within a short time; oftentimes neither are they wrapped



SKETCH BY WAYNE M. JUDY

Reprinted courtesy "Quick Frozen Foods"

A chart showing how a venison carcass is cut for freezing.

properly when stored in a freezer. This is not good practice and will result in inferior game meat. As soon as birds are brought home or back to camp, pluck and dress them as one would any poultry for roasting (described on p. 155). To pluck game birds, the wax method is recommended as best: First rough pick the birds dry or semi-scald (p. 155) and then rough pick; melt down about 2 pounds of paraffin wax, depending upon the quantity of birds to be plucked; dip or roll birds in the melted wax, let stand until wax is set, then peel off wax coating which takes every trace of pin feathers or down off the skin along with it.

Cutting and Packaging Small Game

Those birds which are to be roasted whole are prepared as poultry and packaged as roasts; those birds which are quartered or cut up are prepared and packaged as broilers or disjointed poultry. (See pp. 155–156.)

Small four-footed game is cut up and packaged the same as cut-up poultry; or, if to be cooked in halves or quarters, may be packaged the same as broilers.

Labeling Game for Freezer

No matter what the local game storage rulings are, if you are permitted to store game foods it is a wise precaution on the part of the sportsman to label his game food for freezing with as complete information as possible: contents, of course; name, address; hunting or fishing license permit number; date of placing game in storage; and certificate, or certificate number allowing game to be brought into the state if bagged in another state.

Freezing Game Meat

All the freezing rules which apply to the freezing of meat, also apply to the freezing of game meat: freeze as

soon as possible except where aging is desired; freeze in small packages (one large roast, one large steak, four chops, etc.) so meat will freeze rapidly; package as carefully as any foods for freezing; maintain storage temperature at 0° F., or below.

Pointers for the Fisherman

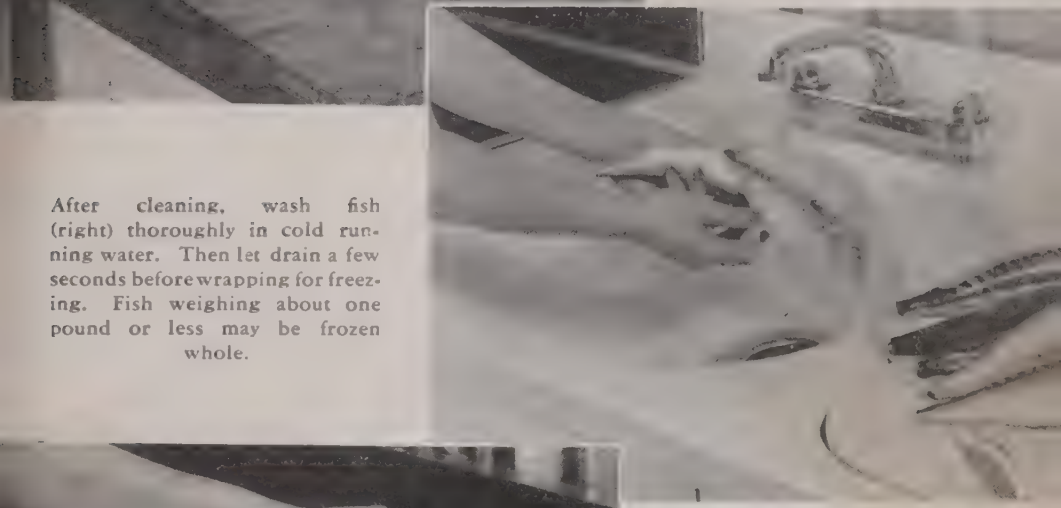
Protect fish from exposure to air and warm sun unit they can be brought home or to camp. If fish are still alive when caught, they can be strung on a line running through the gill and mouth and then placed back in the water for safe-keeping; if fish are dead, immerse them in clean fresh water, or place them in a well-insulated container with chipped ice. On shipboard this is a comparatively easy thing to do; but for the angler at a stream several miles from habitation, it may be out of the question and his creel may be his only protection against sun and air.

Fish is very perishable and should receive the best possible care until it is wrapped and placed in the freezer for freezing and storage; and this should be done at the very first opportunity, even at the resort or camp if freezing facilities are at all available.

Only the larger fish such as halibut, swordfish, or salmon need not be eviscerated *if* they can be frozen within a very short time after taken from the water. However, for all practical purposes, it is better to prepare them for table use by eviscerating, trimming, and cutting into steaks or chunks before freezing. Besides the convenience of the ready-to-cook food, you save considerable freezing space by eliminating waste before packaging.

So it is always economical of freezer space to prepare fillets, steaks, or chunks from fish weighing over 1 pound. A 4-pound fish yields about $1^1/_2$ pounds of edible food.

Preparation of small whole fish for freezing is here illustrated. (*Photographs reproduced through courtesy of the General Electric Co.*) First step (left), fish are scaled, then beheaded and eviscerated; tail and fins are trimmed.



After cleaning, wash fish (right) thoroughly in cold running water. Then let drain a few seconds before wrapping for freezing. Fish weighing about one pound or less may be frozen whole.

Wrap each fish separately in moistureproof Cellophane or any other recommended moistureproof wrapping. This will prevent the fish from freezing together, and will facilitate thawing as well as easy removal from storage for the quantity needed.

Pack individually wrapped fish in large sized top-opening folding carton, no more than six or eight to the package. Close carton; label, giving contents and date. Then over-wrap carton with moistureproof Cellophane and heat-seal. Freeze immediately. Fish are best if frozen the same day they are caught.

Larger fish such as salmo may be cut into steaks o chunks. After cutting o head, eviscerating, trimmin tail and fins, and washing thor oughly, the fish is cut cross wise retaining one backbon vertebra in each steak.

Chunks are cut the same a steaks but in pieces about si inches long suitable for bak ing. Lean fish (see page 156 steaks or fillets should b dipped in a weak brine solu tion for a few seconds, ther wrapped individually in mois tureproof sheeting.

Pack in carton, then over-wrap carton with moistureproof paper and heat-seal. Fish cut into chunks may be packaged the same as a roast. Prepar ing fish steaks for freezing. (*Photographs, courtesy General Electric Co.*)

But there will be many a prize trout, pike, or bass which should be frozen whole—intact so the angler has proof of his "big fish" stories and can supply same when pressed to the point of either dishonor or exalted integrity. With such medium-sized fish, this can be done. They are then suitable for baking or planking, making their appearance at the table in all their due glory. Eviscerate, wash out cavity thoroughly with fresh cold water, freeze and ice glaze the whole fish as described on page 157. After the protective ice coating has been formed on the whole fish, be sure to wrap it in moistureproof paper to protect the glaze from chipping during storage.

Small fish under 1 pound are also usually left whole—eviscerated, of course, and with head and tail trimmed These small fish may be given an ice glaze, then packed in a folding waxed carton of suitable size for protection during storage. Or they may be wrapped individually in moistureproof Cellophane, and then packed in the same type of carton which is then over-wrapped with the moistureproof Cellophane and heat-sealed.

Never put an ice glaze on fish which have been skinned —only on those fish which are whole where the flesh is not exposed. However, when the fish have scales, they should be scaled before icing or preparing for freezing.

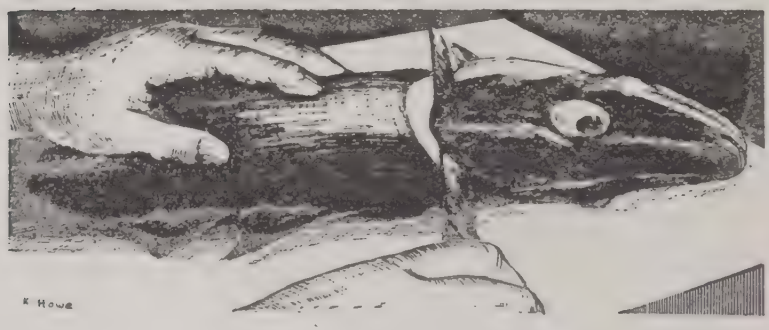
Have you ever thought of a curry comb as a handy gadget for scaling fish? If this task irks or stumps you, buy one at a hardware store that still caters to the horse business.

Medium to small fish are usually made into fillets. Larger fish are cut into steaks for individual servings, or chunks for family servings.

Fillets are made by removing the edible part of the fish from the "skeleton" (backbone, head and tail). With a sharp knife, make a cut the length of the fish along the

dorsal fin. Then cut down to the backbone at the neck When the knife reaches the backbone, turn the knife fla and cut the flesh along the bone to the tail, exerting a steady pushing pressure. Lift off the fillet, then turn fish over and around and repeat the operation on the other side. See illustrations.

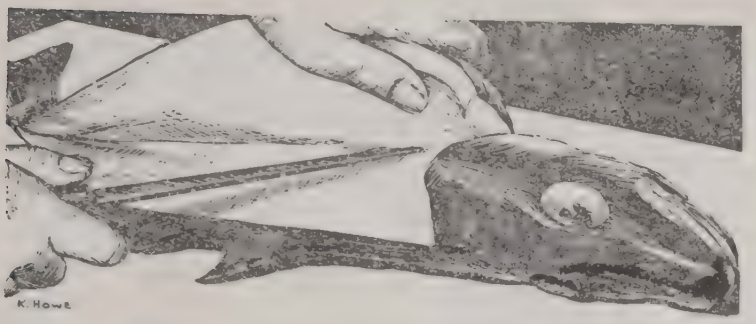
First cut is along dorsal fin.



Cuts courtesy "The Locker Operator"

Cutting at neck or collarbone.

Sometimes fillets are skinned. To do this, place the fillet on a cutting board with the skin side down. Insert a large-bladed knife between the skin and the flesh; hold the knife steady with the right hand, and with the left pull the skin toward you as you skim the knife along the under side of the skin.



Cutting along backbone—to remove fillet.

Freeing fillet at the tail.

Cuts courtesy "The Locker Operator"

Removing skin from the fillet.

To prepare fish steaks behead, eviscerate, and trim fins Then with the backbone toward you, cut sections throug the body of the fish from $1^1/_2$ to $1^3/_4$ inches thick, startin from the head and cutting toward the tail. As the tai portion narrows, thicker steaks may be cut or the tai section may be filleted.

Chunks are cut like steaks only in large portions of 4 to inches in thickness, the chunks suitable for baking.

Follow instructions for wrapping fillets, steaks, an chunks given on page 157.

In order to prevent excessive drip when thawing, a lean fish fillets and steaks should be dipped for a few sec onds in brine solution (see page 156 for details) befor packaging. These fish include: bass, cod, croaker flounder, haddock, hake, halibut, mullet, perch, pollock pompano, porgy, red grouper, red snapper, rockfish sablefish (black cod), sheepshead, sole, sturgeon, sword fish, tomcod, tuna, weakfish, whiting, and fresh wate perch, trout, bass, pickerel, pike, bluegills (sunfish), buf falo, carp, sucker. Those which do not need the brin treatment include: alewives, bluefish (in the fall of th year), butterfish, herring, mackerel, shad, eel, salmon smelt, turbot, catfish (bullheads).

When Game Comes Out of the Freezer

All game fish, birds, and meat are thawed the same a domestic fish, poultry, and meat are thawed for cookin purposes (p. 182). But there the similarity to treatin game foods as ordinary domestic foods most often end because each hunter and fisherman revels in his own pe theories for bringing out special epicurean flavors by cook ing game with sauces, seasonings, or wine for exotic an wonderful tastes.

Since one of the sportsman's delights is to discover new and different ways to serve his choice morsels and rare tidbits, here is our contribution to enlarging his fund of game cooking lore:

Stuffed Slices of Venison

2 lbs. thinly sliced venison
2 cups bread crumbs
6 tbsp. butter
1 onion, minced
2 tbsp. parsley, minced
4 egg yolks
2 tbsp. boiled ham
2 tbsp. Parmesan cheese
1 pinch thyme
Salt and pepper
Melted butter
Bread crumbs

Procedure: Make a stuffing by browning the bread crumbs in butter in one pan, and sautéing onion, parsley, and ham in butter in another pan; combine sautéed mixture and add egg yolks, cheese, thyme, salt, and pepper; mix well. Place about 1 tbsp. stuffing on each slice of venison, roll or turn in edges, and skewer. Dip each skewered slice in melted butter, then in bread crumbs, and bake until done.

Venison Cutlets in Sour Cream Gravy

2 lbs. venison steak
1/2 cup sour cream
Salt and pepper
Bayleaf
2 tbsp. butter
Flour
Celery salt
Worcestershire sauce

Procedure: Cut venison into individual cutlets; roll in well-seasoned flour; place in heavy skillet with melted butter; brown venison on both sides over medium heat. When venison is nicely browned, pour the sour cream over the meat and season with salt, pepper, Worcestershire sauce, bayleaf, and celery salt. Place cover on skillet and cook over low heat until tender, about 1 hour.

Stuffed Venison Meat Cakes

2 cups soft bread crumbs
3 tbsp. onion, minced
6 tbsp. shortening, melted
1/2 tsp. poultry seasoning
2 tsp. salt
3 tbsp. water
1 lb. ground venison
1 egg
Pepper

Procedure: Combine bread crumbs, onion, melted shortening, poultry seasoning, and only 1 tsp. of the salt; add water and mix well. Combine ground venison with remaining 1 tsp. salt, pepper to season, and egg. Press meat mixture in bottom of muffin tins, to about 1/2 inch in depth; add layer of stuffing, then fill muffin tin with meat mixture. Bake in 375° F. oven for about 30 minutes.

Smothered Venison

3 lbs. venison round or rump
Salt and pepper
Flour
1 tsp. celery seed
2 tbsp. prepared mustard or horseradish
1 cup strained tomatoes

Procedure: Season the venison with salt and pepper, and roll in flour; place in Dutch oven or heavy covered pan and brown on all sides in melted fat; add the celery seed, prepared mustard or horseradish, and strained tomatoes; cover and simmer for about 3 hours, or until the venison is tender.

Venison Grillades

1 steak cut from venison round
Salt and pepper
Cayenne pepper
1 clove garlic, minced
1 large onion, minced
1 tbsp. fat
1 tbsp. flour
1 cup fresh or canned tomatoes
1/2 tbsp. vinegar
1 cup water

Procedure: Cut venison round into pieces about 4 inches square (grillades) and season highly with salt, pepper, and cayenne. Melt the fat in skillet, and when hot add minced onion and garlic; when brown, add the flour and mix with fat; add chopped tomatoes, then place grillades in skillet mixture to brown nicely on both sides. When grillades are brown, add the vinegar and water, cover closely, and simmer until grillades are tender (about 1/2 hour), stirring occasionally during cooking.

Barbecued Venison Chops with Savory Butter

6 venison chops
4 tsp. dry mustard
1 tbsp. onion, minced
1 tbsp. parsley, minced
1/2 cup soft butter
1/2 cup chili sauce
1/3 cup lemon juice
1 tsp. salt

Procedure: Thoroughly blend mustard, onion, parsley, and butter and shape into a roll; chill hard. Combine chili sauce, lemon juice, and salt. Arrange chops for barbecuing 12 to 14 inches above glowing coals. Broil for 45 minutes, brushing with the chili sauce mixture every 15 minutes; turn chops once, about 20 minutes before they are done. Slice butter roll and place a slice on top of each hot chop. Serve immediately.

Courtbouillon Bonfouca

1 red snapper (or red) fish
3 sprigs thyme
1 bayleaf
1 clove garlic
1 qt. water
Salt, cayenne or pepper to taste
3 tbsp. butter
1 tbsp. Worcestershire sauce
1/2 doz. allspice, mashed
6 sprigs parsley
1 large onion
6 large fresh tomatoes
Juice of 1 lemon
3 tbsp. flour
1 cup claret wine
1/2 cup olive oil

Procedure: If the fish is frozen whole, thaw completely and cut it into steaks. Put head and tail (or one small piece of the fish) in sauce pan, add 1 pt. of the water, onion, garlic, bayleaf, allspice, parsley, lemon juice, tomatoes and boil until mixture is cooked down, then remove head and tail if these were used. Pour olive oil into deep skillet; add fish steaks, liquid from cooked head, and remaining pint of water. Melt butter and add flour, stirring to a smooth paste; then stir into fish mixture. Lastly add claret and Worcestershire sauce to fish mixture and simmer until fish is tender.

Barbecued Fish

1/2 cup butter
3/4 tsp. salt
1 tbsp. chili powder
1 1/2 cups tomato juice
1 large fish (flounder, redfish)

Procedure: Mix seasoning ingredients together and boil until thick, then set over boiling water to keep sauce hot. The fish may be barbecued whole, or split down the back; dust generously with salt and pepper; place under broiler (if fish is split, place under broiler first with skin side down); broil, keeping fish well basted with the barbecue sauce.

Epicurean Fish Cutlets

1 3/4 cups flaked, cooked fish
1/2 tbsp. shallot, finely chopped
2 tbsp. pimiento, finely chopped
3 tbsp. butter
1/3 cup flour
3/4 tsp. salt
1/4 tsp. paprika
1/2 cup milk
1/2 cup cream

Procedure: Cook shallot and pimiento with butter for about 5 minutes, stirring constantly; add flour which has been mixed with salt and paprika, and stir until flour and fat are well blended; then add milk and cream gradually, stirring constantly; bring to a boil, and add fish; remove from heat and chill. When mixture has chilled, shape into cutlets, dip in crumbs, and fry in deep fat. Serve with the following epicurean sauce:

3 tbsp. mayonnaise
2 tbsp. prepared horseradish
1/2 cup heavy cream
1/2 to 1 tsp. prepared mustard
1/2 tsp. salt
Few grains cayenne

Beat cream until stiff; fold in remaining ingredients.

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